

DOCUMENT RESUME

ED 314 628

CE 053 987

TITLE Agriculture. Access Skills. Vocational Readiness Skills. Missouri LINC. Assessing Vocational Education.

INSTITUTION Missouri Univ., Columbia. Dept. of Practical Arts and Vocational-Technical Education.; Missouri Univ., Columbia. Dept. of Special Education.

SPONS AGENCY Missouri State Dept. of Elementary and Secondary Education, Jefferson City.

PUB DATE Sep 88

NOTE 213p.; For related documents, see CE 053 979-990.

AVAILABLE FROM Instructional Materials Laboratory, 10 London Hall, University of Missouri-Columbia, Columbia, MO 65211 (\$13.30).

PUB TYPE Guides - Classroom Use - Guides (For Teachers) (052)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.

DESCRIPTORS *Access to Education; Agribusiness; *Agricultural Education; Agricultural Machinery; Agricultural Machinery Occupations; Communication Skills; Competency Based Education; *Educational Diagnosis; Educational Objectives; Employment Potential; Horticulture; Interpersonal Competence; Landscaping; Mathematics Skills; *Occupational Information; Secondary Education; Small Engine Mechanics; *Special Needs Students; Vocational Aptitude; Vocational Education; Vocational Evaluation; Vocational Maturity

IDENTIFIERS *Missouri

ABSTRACT

This document contains agriculture occupations-related materials to help teachers and parents teach access skills to Missouri junior high and high school special needs students who want to pursue a vocational program in agribusiness, agricultural management, and economics; agriculture power, agricultural machinery, and small engine repair; or horticulture and landscaping. Access skills are defined as those skills needed to access vocational education programs and be successful in the world of work. An introduction explains this document's relationship to other documents about Missouri vocational education. The section on manual components describes the document's contents. The next three sections contains instructional activities in the chosen vocation. The activities cover each of the five major areas (math, physical demands and working environment, aptitudes, temperament, and vocational) of Missouri's Vocational Readiness Inventory. Competencies, an access skills checklist on which teachers can record student competence, occupational glossaries, teacher and student worksheets, worksheet answers, and resource lists are included. The next six sections are instructional modules on applying ratios in mixtures, communicating effectively with employers, co-workers and the public, gross motor skills, safety procedures, and tool identification. The modules include task analysis sheets and directions for instruction. The document concludes with competency lists for agriculture structures I, II, and III. (CML)

ED314628

Access Skills Vocational Readiness Skills for Agriculture



ED053987

Accessing Vocational Education

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ACCESS SKILLS
Vocational Readiness Skills for
Agriculture



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The project which is the subject of this handbook was supported in whole by funds from the Missouri Department of Elementary and Secondary Education. However, the opinions expressed herein do not necessarily reflect the position or policies of the Missouri Department of Elementary and Secondary Education and no official endorsement should be inferred.

September, 1988

This Book is Available From:
Instructional Materials Laboratory
10 London Hall
University of Missouri-Columbia
Columbia, MO 65211

Call Toll Free in Missouri
1-800-392-7217

ACKNOWLEDGEMENTS

Missouri LINC would like to express appreciation to all vocational education and special education instructors who have helped create the ACCESS SKILLS: Vocational Readiness Skills manuals. Ideas for activities came from many people who, as practitioners in the field, have first-hand knowledge of effective methods which meet the needs of students. Their dedication to special needs students provides valuable assistance to Missouri LINC staff in the development of resources and materials which enable students to become the best they can be.

A special thanks to our contributing authors who gave us some of the activities found in the manual:

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We are grateful to LINC staff members,

Jan Wheeler, Graduate Research Assistant, and

David Gray, Instructor,

for their proofreading and editing comments, as well as to our typist, who also helped in editing,

Victoria Bowlin, Senior Clerk Typist.

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INTRODUCTION

Since 1981, Missouri educators have been utilizing the Entry Level Skills Criteria (ELSC) Manual to help prepare special needs students for entry into and successful completion of vocational training programs. With the passage of the Carl D. Perkins Vocational Education Act (P.L. 98-524), the Missouri mandate for instructional management systems and competency-based education, there was a need to revise the ELSC Manual. These revisions make the materials more compatible with the recent educational changes and better meet the needs of practitioners in the field. ACCESS SKILLS is the new name for the ELSC.

ACCESS SKILLS: Vocational Readiness Skills are defined as those skills which appear to be correlated to success in vocational education programs. If a student acquires as many of these skills as possible, the chances of success are higher for the chosen vocational program. The ACCESS SKILLS: Vocational Readiness Skills are negotiable skills; that is, students who are deficient in one or more areas may still enter vocational programs. Through assessment, these weak areas will be determined and vocational instructors and support personnel can then continue to work on the skills during vocational training. There has been a great deal of confusion with the original term "entry level skills". This terminology in vocational education usually refers to the skills needed to enter the world of work. ACCESS SKILLS better explains the objective: to identify, assess and teach skills needed to access vocational education programs and be successful in the world of work.

The ACCESS SKILLS are available in several manuals:

ACCESS SKILLS: Vocational Readiness Skills Inventory for Special Needs Students (Revised Entry Level Skills Inventory)

ACCESS SKILLS have been identified for vocational programs listed on the Vocational Administrative Management System (VAMS). Skill areas include math, physical demands/working environment, aptitudes, temperament and vocational. Sample occupational areas, Classification of Industrial Programs (CIP) codes, and Dictionary of Occupational Titles (DOT) codes have been included as well as employability and study skills. The ACCESS SKILLS lists will also be included on VAMS.

ACCESS SKILLS: Employability and Study Skills Assessment and Curriculum Guide

This guide includes informal assessment instruments to evaluate thirty-five employability and study skills with instructional activities included to teach each skill. This guide was designed for junior high students, but is applicable to any secondary student with needs in these areas.

ACCESS SKILLS: Generic Informal Assessment Instruments and Checklist

This manual contains informal assessment instruments for each of the ACCESS SKILLS: Vocational Readiness Skills Inventory and also a checklist for documenting the assessment.

ACCESS SKILLS: Vocational Readiness Series

ACCESS SKILLS: Vocational Readiness Skills for Agriculture

ACCESS SKILLS: Vocational Readiness Skills for Business & Office

ACCESS SKILLS: Vocational Readiness Skills for Marketing & Cooperative Education

ACCESS SKILLS: Vocational Readiness Skills for Health Occupations

ACCESS SKILLS: Vocational Readiness Skills for Occupational Home Economics

ACCESS SKILLS: Vocational Readiness Skills for Trade & Technical

The ACCESS SKILLS: Vocational Readiness Skills manuals were developed by occupational cluster areas and include the lists from the Vocational Readiness Skills Inventory for Special Needs Students as well as activity suggestions and instructional modules for teaching the different skills necessary for each program area.

NOTE:

Two vocational programs in Agriculture; Agricultural Structures and Agricultural Construction, do not have instructional activities in this book. The ACCESS SKILLS in these two areas are very closely related to welding (Agricultural Structures) and Carpentry (Agricultural Construction) which have instructional activities in the ACCESS SKILLS: Vocational Readiness Skills for Trade and Technical. Students interested in either of these agricultural programs should be assessed and instructed following the skills for welding and carpentry.

MANUAL COMPONENTS

VIMS COMPETENCY LIST

This list is found at the beginning of each program area. Each list contains the exit level skills from the program area taken from the standardized Vocational Instructional Management System (VIMS). Vocational instructors will train students in the majority of these skills and may add skills for an individual student or for all students. It is important to note that not all students must master all of the competencies. The Individual Educational Planning (IEP) team can decide which competencies a student is able to master in a given time period. The specified competencies should be designed to lead to a job; that is, a student should be able to learn skills necessary for a job in the community. These competency lists are included so that:

- (1) the teacher, student, and parent may see in advance the types of skills which will be presented to students. In this way, the IEP team may have a better idea if the vocational area is reasonable and appropriate for the student;
- (2) the relationship between the ACCESS SKILLS: Vocational Readiness Inventory and the exit level competencies can be better understood. For example, in the Horticulture area*:

<u>ACCESS SKILLS</u> <u>Vocational Readiness Inventory</u>	<u>VIMS</u> <u>Exit Competency</u>
<u>MATH</u> Perform standard units of measurement, i.e., cup, pint, quart, inch, foot, yard, ounce, pound	Safely mix chemicals
<u>PHYSICAL DEMANDS/WORKING ENVIRONMENT</u> Seize, hold, grasp, turn or otherwise work with the hand or hands (handling)	Remove weeds manually from crops
<u>APTITUDES</u> Comprehend the two-dimensional representation of three-dimensional objects (S-spatial)	Interpret landscape or interior- scape plane
<u>TEMPERAMENT</u> Performing repetitive work, or performing continuously the same work, according to set procedures, sequences, or pace	Prepare/plant seeds
<u>VOCATIONAL</u> Demonstrate knowledge of basic safety concepts	Maintain gasoline engines

*NOTE: VIMS for the Landscaping area is currently the same as Horticulture.

The ACCESS SKILLS: Vocational Readiness Inventory lists are very basic skills which are needed across vocational areas; therefore, many of them are the same, even across different vocational areas. However, if a student possesses these basic skills, then the outcome skills (VIMS exit competencies) will be easier for the student to attain.

ACCESS SKILLS CHECKLISTS

Each vocational program manual will contain a summary checklist of the skills needed for the area the student wishes to pursue. After assessing the skills with the ACCESS SKILLS: Generic Informal Assessment Instruments, or other formal or informal assessments, the teacher can transfer the information obtained onto the summary checklist. On the checklist, each ACCESS SKILL is broken down into its component parts and the teacher will designate the student's performance or ability by circling the appropriate mastery code number.

- 3 = mastery
- 2 = requires supervision
- 1 = not mastered
- N = no exposure

There is room on the checklist to fill in a mastery date as well as a retry code and date even later in the year. After completion of the assessment, the areas of weakness can and should become goals in the IEP. This checklist should be sent to the Area Vocational School as part of the student's application. The codes (3, 2, 1, N) can be entered into the VIMS system if the vocational school desires to follow the student's mastery of skills.

A student does NOT have to show mastery of every skill on the ACCESS SKILLS list in order to enter a vocational program. These skills are negotiable and can continue to be practiced during vocational training. The deficient areas should help the planning team in developing realistic vocational goals and objectives and appropriate vocational training for the student. They also should help vocational personnel identify what skills still need to be practiced and/or what curriculum modifications need to be made to insure the success of the student.

Students with physical limitations may never achieve some of the ACCESS SKILLS, especially in regards to dexterity and other physical demands. This does not preclude them from entering and succeeding in an appropriate vocational area. In these cases, the teacher should make a comment regarding the compensatory techniques the student uses (i.e., strikes typewriter with pencil instead of fingers) and list any modifications that might be needed (i.e., typewriter template, longer time to complete assignments, etc.).

INSTRUCTIONAL ACTIVITIES

This section in each manual is designed to give teachers suggestions for activities that may be used to teach and develop a student's weaker skills found during the assessment. It is assumed that students entering vocational programs have fundamental math skills such as counting, adding, subtracting, multiplying, and dividing one place numerals. The activities usually begin with more advanced skills (working with two place numbers), and all are related to the specific program area the student has chosen.

Each of the five major areas of the ACCESS SKILLS: Vocational Readiness Inventory are covered (math, physical demands/working environment, aptitudes, temperament, and vocational). The activities often overlap, but repetition of previously learned material is often helpful for special needs students. For example, the majority of activities require dexterity skills (writing food orders, typing, handling boxes of different weights). Some activities require basic math skills in adding column totals, etc. However, since the activities are related to job tasks in the vocational area many students will not notice the overlap of skills. Teachers are encouraged to be innovative in developing other activities to enhance the student's ability in any specific area.

The activities include suggestions for parents, and most are written so as to be easily utilized as IEP goals or objectives. The criterion level for mastery is often not included, as each student's expected level may differ.

Within each vocational program area a vocabulary list is provided, as well as a tool list, when appropriate. In addition, when worksheets for activities are provided, they are found at the end of the section (math, physical demands, etc.).

INSTRUCTIONAL MODULES

These modules are related to the vocational program area, and have been revised from the instructional modules found in the Entry Level Skills Criterion Manual. Some of the modules can also be found in the ACCESS SKILLS: Employability and Study Skills Assessment and Curriculum Guide, but have been adapted to the specific vocational program area.

RESOURCE MATERIALS

At the end of each program area, a list of resource materials is provided to help supplement the activity suggestions. Names and addresses of publishers are included. An Area Vocational School may already have some of these materials, as might other teachers in the building, so it would be advisable to check with other teachers prior to purchasing.

VIMS COMPETENCIES FOR AGRIBUSINESS

A. How Agribusiness Functions

1. Define the free enterprise system in relation to the agricultural industry
 2. Compare the business structures of the four types of agribusiness
 3. Outline the primary business activities in an agribusiness
 4. Explain the role of the employee in an agribusiness
 5. Trace the steps involved in starting an agribusiness
- Other (specify):

B. Human Relations in Agribusiness

1. Discuss the importance of human relations skills and positive personality traits in an agribusiness employee
 2. Identify a basic hierarchy of needs which influences human actions and attitudes
 3. Distinguish between the skills and traits contributing to agribusiness employee success and failure
 4. Contrast how a worker deals with "superiors," "peers" and "subordinates" on the job
 5. Relate how constructive criticism can be used to the advantage of an agribusiness worker
 6. Outline the steps in systematic problem solving
- Other (specify):

C. Verbal Communication

1. Relate steps for effective idea presentation and communication
 2. Analyze components of the skills of listening and answering questions
 3. Demonstrate acceptable procedures for answering business telephones and taking telephone messages in an agribusiness setting
 4. Explain the role and ramifications of nonverbal communications with regard to verbal communications
- Other (specify):

D. Written Communications

1. Explain the need for and the basic elements of effective written communications in agribusiness
2. Compose a business letter and an office memorandum

3. Prepare a resume, letter of application, and an application form
- Other (specify):

E. Selling Skills

1. Identify the importance of each person "selling" in agribusiness
 2. Identify the skills needed to sell in agriculture
 3. Select appropriate methods of meeting customer needs
 4. Approach the potential customer
 5. Give a sales presentation of agricultural supplies and products
 6. Describe the technique of suggestion selling
 7. Effectively handle resistance
 8. Close a sale
- Other (specify):

F. Advertising and Display

1. Describe various methods of promotion as related to agriculture
 2. Recognize how advertising is used
 3. Describe the different types of advertising media used
 4. Identify how to use give-away items or services as promotion *
 5. Identify how to use radio and television as promotion *
 6. Identify how to use direct mail effectively as promotion *
 7. Design an agribusiness display
 8. Recognize ways of maintaining and increasing the effectiveness of displays
- Other (specify):

G. Business Procedures and Records

1. Describe why different business procedures and records are needed in an agribusiness
2. Identify how to make customer transactions
3. Prepare a sales ticket
4. Prepare a weight scales ticket *
5. Identify the proper procedures for handling credit in an agribusiness
6. Describe how inventory is managed and how the selling price of merchandise is determined
7. Describe the basic elements of record-keeping and checking account procedures
8. Identify how sales and purchasing records are kept

* Validated competencies that were not included in the Agribusiness curriculum. The instructor may wish to use additional material in order to cover these competencies.

AGRIBUSINESS

Sample Occupational Area:

Sales Representative, Farm & Garden

Equipment & Supplies

Sales Representative, Herbicide Service

Sales Representative, Livestock

Introduction

An individual working in the field of Agribusiness must have positive personal relationship skills. Dealing with farm supply businesses as well as with individual farmers requires effective communication skills. An Agribusiness person must know the products with which they deal and be knowledgeable in marketing and selling procedures and techniques. The ability to use tax tables and to work with bank accounts is also needed. In addition, the use of technology such as microfiche and personal computer spreadsheet programs is beneficial.

Because the success of an Agribusiness individual depends a great deal on the ability to communicate and demonstrate acceptable social behaviors with employees and customers a great deal of attention should be given to the student's social skills. If they are quite deficient, the instructor may wish to review activities in the communication and social skills modules found in the ACCESS SKILLS: Employability and Study Skills Assessment and Curriculum Guide.

The skills needed in the agricultural management and economics field are very closely related to the skills used in agribusiness. For this reason the activities in this section may be used as access skills for agricultural management and economics. Vocational Instructional Management Systems (VIMS) have not yet been written for the agricultural management programs. For future information on content of this program it is recommended that the teacher and student visit the classroom at the local area vocational technical school.

9. Describe basic income tax requirements for agribusiness *
10. Identify types of insurance needed by agribusiness to help protect them from losses
11. Demonstrate the use of basic parts on a cash register
12. Demonstrate the use of an adding machine and an electronic calculator
13. Identify the proper procedures in using the microfiche viewing equipment
Other (specify):

8. Correctly store flammable materials *
9. Install and adjust safety devices *
10. Identify safety zones around equipment*
Other (specify):

H. Personal Management

1. Identify the needs and considerations for setting career goals
2. Identify social and personal competencies associated with career success
3. Evaluate methods for managing personal financial resources
4. Identify the types of housing that satisfy personal and career needs *
5. Identify the types of transportation that satisfy personal and career needs *
6. Identify possible community resources for help with personal problems or guidance for personal improvement
Other (specify):

I. Microcomputers in Agribusiness

1. Identify specific applications of microcomputers in agribusiness and sources of software for these applications
2. Identify major components of the microcomputer and their functions
3. Prepare a fertilizer worksheet using a microcomputer
Other (specify):

J. Safety Precautions **

1. Apply first aid techniques *
2. Follow safe work habits *
3. Identify and correct potential safety hazards *
4. Use fire extinguishers *
5. Wear appropriate protective or work clothing *
6. Interpret information on labels and signs *
7. Use proper lifting and carrying methods *

* Validated competencies that were not included in the Agribusiness curriculum. The instructor may wish to use additional material in order to cover these competencies.

** A student must receive a Rating Scale of #3 Mastered for all of the competencies in the Safety Precautions Duty Band.

AGRIBUSINESS
ACCESS SKILLS CHECKLIST

Student Name/ID _____ Sending School _____

Instructor _____ Date(s) Evaluated _____

Circle proper mastery code: 3 = MASTERY 2 = REQUIRES SUPERVISION
 1 = NOT MASTERED N or blank = NO EXPOSURE

<u>TASK DESCRIPTION</u>	<u>TASK ID #</u>	<u>MASTERY CODE</u>	<u>MASTERY DATE</u>	<u>RETRY CODE/DATE</u>
1. Count two-place numbers	010500A001	3 2 1 N	_____	_____
2. Add two-place numbers	010500A002	3 2 1 N	_____	_____
3. Subtract two-place numbers	010500A003	3 2 1 N	_____	_____
4. Perform standard units of measure ment, i.e., cup, pint, quart, inch, foot, yard, ounce, pound	010500A004	3 2 1 N	_____	_____
5. Use basic measuring instruments, i.e., rulers, scales	010500A005	3 2 1 N	_____	_____
6. Multiply two-place numbers	010500A006	3 2 1 N	_____	_____
7. Divide two-place numbers	010500A007	3 2 1 N	_____	_____
8. Add common fractions	010500A008	3 2 1 N	_____	_____
9. Subtract common fractions	010500A009	3 2 1 N	_____	_____
10. Multiply common fractions	010500A010	3 2 1 N	_____	_____
11. Divide common fractions	010500A011	3 2 1 N	_____	_____
12. Add two-place decimals	010500A012	3 2 1 N	_____	_____
13. Subtract two-place decimals	010500A013	3 2 1 N	_____	_____
4. Multiply two-place decimals	010500A014	3 2 1 N	_____	_____
15. Divide two-place decimals	010500A015	3 2 1 N	_____	_____
16. Add discount, interest and percentage	010500A016	3 2 1 N	_____	_____
17. Subtract discount, interest and percentage	010500A017	3 2 1 N	_____	_____
18. Multiply discount, interest and percentage	010500A018	3 2 1 N	_____	_____
19. Divide discount, interest and percentage	010500A019	3 2 1 N	_____	_____
20. Add surface areas, values, weights and measures	010500A020	3 2 1 N	_____	_____
21. Subtract surface areas, values, weights and measures	010500A021	3 2 1 N	_____	_____
22. Multiply surface areas, values, weights and measures	010500A022	3 2 1 N	_____	_____
23. Divide surface areas, values, weights and measures	010500A023	3 2 1 N	_____	_____
24. Lift 20 lbs. maximum with frequent lifting and/or carrying of objects weighing up to 10 lbs. (light work)	010500B001	3 2 1 N	_____	_____

AGRIBUSINESS
ACCESS SKILLS CHECKLIST

Student Name/ID _____ Sending School _____

Instructor _____ Date(s) Evaluated _____

Circle proper mastery code: 3 = MASTERY 2 = REQUIRES SUPERVISION
 1 = NOT MASTERED N or blank = NO EXPOSURE

<u>TASK DESCRIPTION</u>	<u>TASK ID #</u>	<u>MASTERY CODE</u>	<u>MASTERY DATE</u>	<u>RETRY CODE/DATE</u>
25. Extend the hands and arms in any direction (reaching)	010500B002	3 2 1 N	_____	_____
26. Seize, hold, grasp, turn or otherwise work with the hand or hands (handling)	010500B003	3 2 1 N	_____	_____
27. Pick, pinch, or otherwise work with the fingers (fingering)	010500B004	3 2 1 N	_____	_____
28. Perceive size, shape, temperature or texture of objects and materials by using fingertips (feeling)	010500B005	3 2 1 N	_____	_____
29. Ability to work inside	010500B006	3 2 1 N	_____	_____
30. Coordinate eyes and hands or fingers rapidly and accurately (K-motor coordination)	010500C001	3 2 1 N	_____	_____
31. Make a movement response accurately and swiftly (K-motor coordination)	010500C002	3 2 1 N	_____	_____
32. Move the fingers and manipulate small objects with the fingers, rapidly or accurately (F-finger dexterity)	010500C003	3 2 1 N	_____	_____
33. Move the hands easily and skillfully (M-manual dexterity)	010500C004	3 2 1 N	_____	_____
34. Work with the hands in placing and turning motions (M-manual dexterity)	010500C005	3 2 1 N	_____	_____
35. Influence people in their opinions, attitudes, or judgments about ideas of things	010500D001	3 2 1 N	_____	_____
36. Making generalizations, evaluations, or decisions based on sensory or judgmental criteria	010500D002	3 2 1 N	_____	_____
37. Dealing with people beyond giving and receiving instructions	010500D003	3 2 1 N	_____	_____
38. Demonstrate knowledge of basic safety concepts	010500E001	3 2 1 N	_____	_____

AGRIBUSINESS VOCABULARY LIST

ADVERTISING	the means used to attract public attention to a product or business
BONUS *	monies paid above and beyond regular wages
BULK DISCOUNT	buying an extremely large amount of an item that is not packaged or is in very large packages. For example, a truckload of corn rather than corn in 25 lb. bags.
CASH DISCOUNT	discount given to a customer for paying bill in full at time of purchase
CASHIER	the person responsible for handling cash transactions in a business
COMMISSION *	employees who work on commission receive pay based upon the amount of sales they made during a specified time period
CUSTOMER	a person who buys goods or services
CWT.	cost per 100 pounds
DEDUCTIONS *	amounts of money taken from the employee's regular earnings. Deductions include social security, federal and state taxes
DISCOUNT	an amount deducted from the the sale price of an item for specific reasons
DISPLAY	an advertisement to catch the eye as distinguished from a classified ad
EARLY SEASON DISCOUNT	discount for purchasing prior to a particular use season
INVOICE	the detailed list of goods shipped or services given with detailed costs
MARKUP	an increase made in the original price of an item
MERCHANDISE	items or goods to be bought or sold
MERCHANDISING	all the business activities that bring goods or services to customers
PERCENTAGE	an amount of a whole that varies in proportion to a larger sum, such as total sales

PRICING	to fix or establish the price or cost of an item to be sold
PROFIT	the return received on a business undertaking after all expenses have been met
PROMOTION	to encourage people to buy a specific item or service
QUANTITY DISCOUNT	discount given for purchase if a large amount of a product
RESUME	a summary or brief history of one's personal work history or experience submitted with a job application
SALES	the activities involved in selling goods or items

* indicates usage in future activity

AGRIBUSINESS

Math Skills

Count two-place numbers	Divide two-place decimals
Add two-place numbers	Add discount, interest and percentage
Subtract two-place numbers	Subtract discount, interest and percentage
Perform standard units of measurement, i.e., cup, pint, quart, inch, foot, yard, ounce, pound	Multiply discount, interest and percentage
Use basic measuring instruments, i.e., rulers, scales	Divide discount, interest and percentage
Multiply two-place numbers	Add surface areas, weights and measures
Divide two-place numbers	Subtract surface areas, weights and measures
Add common fractions	Multiply surface areas, weights and measures
Subtract common fractions	Divide surface areas, weights and measures
Multiply common fractions	
Divide common fractions	
Add two-place decimals	
Subtract two-place decimals	
Multiply two-place decimals	

NOTE: Many math books and workbooks provide needed direction in learning basic operations in math. This section assumes that students have basic skills and is designed to be used in conjunction with any of the math books you might be using, or to establish your own supplemental units. Any math practice activities should be developed within the context of the vocational program. Other persons to use as resources in this area include: parents and math teachers.

1. Given a set balance, student will keep a record of each cash transaction he/she makes for a period of one week. Provide the student with a small book in which a balance may be listed and a place where cash spent can be noted. Give the student a set amount of play money (\$25) to be spent on goods and services received in the classroom. For example, use of the pencil sharpener, 10c; a pencil or piece of paper, 15c; asking a question that does not relate to lesson material, 25c; etc. The student could assist in making up the price list. Every transaction must be recorded. The student must balance the records with the amount of cash remaining. This activity may be expanded in a variety of ways.
2. Student will keep a record of goods and services sold in the classroom. Have student construct a record keeping sheet that includes a place to record the following:
 - a. item or service rendered
 - b. purchaser
 - c. amount charged
 - d. amount paid
 - e. how it was paid

The student should provide a list for items to be sold and/or for services rendered. Other students and teachers should be provided with play money. Other guidelines and rules for the activity may be established in the classroom and put on display for reference. At the end of the week the student must calculate amount sold, amount charged, amount paid in cash and profits based on cash in hand.

3. Student will calculate sales slips for goods sold. The student is to add the sales slips on Worksheet AB #1.
4. Student will determine percentages of sales. Using Worksheet AB #1 student will figure total amount of sales and then compute the amount customers would pay if they received a 2% discount on a cash sale.
5. Student will conduct an inventory and keep records of materials used. Ask student to conduct an inventory of the books in a specific book-case or, if possible, materials that are consumed by the class during the week. After the inventory is written down ask student to record at the end of two days and five days use how much paper was used. The student can calculate the average amount used each day. With this information the student should be able to tell the teacher how much of the item(s) will be needed at the beginning of each week. Have the student keep track of usage of the item(s) for two weeks. Each Friday determine how closely he/she calculated needs. Discuss why differences may have occurred between each week's usage.
6. Student will calculate interest on given amounts. Using Worksheet AB #1 student will total bill and then determine interest customer must pay using the following guidelines:
 - a. accounts past due 10 days - 05%
 - b. accounts past due 30 days - 18%
7. Student will figure discounts for materials based on a specific discount schedule. See Worksheet AB #3 for discount information schedule. Use Worksheets AB #4 for sample problems.
8. Student will figure sales tax on goods sold on the sales tickets on worksheet AB #1. Use worksheet AB #2 to locate amount of sales tax.
9. Student will demonstrate understanding of sales tax exemption in Agribusiness. Discuss contents of worksheet AB # 5 & 6.
10. Student will figure sales taxes on specific items. Use worksheet AB # 7.
11. Student will use a seven step procedure when making change. See Worksheet AB # 8 for procedures. In role play situations using play money have student make purchases and sell items using the seven procedures listed on the worksheet. An adding machine may be used if available to further simulate actual selling situations.

12. Student will practice change making problems. See Worksheet AB #9 & 9A.

SUGGESTIONS FOR PARENTS:

1. Have student inventory pantry in home. Keep a record of items that are used most frequently.
2. Assist in preparing weekly shopping list based on inventory kept of pantry.
3. Allow student to keep track of how he/she spends a specific amount of money for a period of one week. This should be done using a small book for entries of expenditures. Student must account for differences in what records show and money left at week's end.
4. Keep grocery and other sales slips for several weeks. Have student determine amount of money spend on sales tax during that time.

Date _____ 19__

M _____

No. _____

Reg. No.	Clerk	ACCOUNT FORWARDED		
1	corn seed		9	25
2	fertilizer		15	10
3	hoe		20	50
4				
5	TOTAL			
6	less 2%			
7	Sales Tax			
8	TOTAL			
9	5% interest			
10	18% interest			
11				
12				
13				
14				
15				

Your account stated to date. If error is found return at once.

Date _____ 19__

M _____

No. _____

Reg. No.	Clerk	ACCOUNT FORWARDED		
1	shears		18	50
2	work gloves		6	24
3	gas can		10	95
4	ear tags		65	22
5				
6	TOTAL			
7	less 2%			
8	Sales Tax			
9	TOTAL			
10	5% interest			
11	18% interest			
12				
13				
14				
15				

Your account stated to date. If error is found return at once.

Date _____ 19__

M _____

No. _____

Reg. No.	Clerk	ACCOUNT FORWARDED		
1	pest control poison		19	79
2	mulch		6	75
3	chain files		3	50
4	filters		12	69
5				
6	TOTAL			
7	less 2%			
8	Sales Tax			
9	TOTAL			
10	5% interest			
11	18% interest			
12				
13				
14				
15				

Your account stated to date. If error is found return at once.

Date _____ 19__

M _____

No. _____

Reg. No.	Clerk	ACCOUNT FORWARDED		
1	wire		4	38
2	burlap sacks		17	16
3	grass seed		42	90
4	twine		23	00
5	chain saw		2	99 56
6				
7	TOTAL			
8	less 2%			
9	Sales Tax			
10	TOTAL			
11	5% interest			
12	18% interest			
13				
14				
15				

Your account stated to date. If error is found return at once.

Sample City Sales Tax Table

6 1/8%

OPTIONAL
MISSOURI SALES/USE TAX FORMULA

6 1/8%

In State
& Conservation
2% Local TaxesMISSOURI DEPARTMENT OF REVENUE
JANUARY 1983In State
& Conservation
2% Local Taxes

Sale	Tax	Sale	Tax	Sale	Tax	Sale	Tax
8.00-.08	.00	12.00-12.16	.74	24.09-24.24	1.48	36.17-36.32	2.22
.09-.24	.01	12.17-12.32	.75	24.25-24.40	1.49	36.33-36.48	2.23
.25-.40	.02	12.33-12.48	.76	24.41-24.57	1.50	36.49-36.65	2.24
.41-.57	.03	12.49-12.65	.77	24.58-24.73	1.51	36.66-36.81	2.25
.58-.73	.04	12.66-12.81	.78	24.74-24.89	1.52	36.82-36.97	2.26
.74-.89	.05	12.82-12.97	.79	24.90-25.06	1.53	36.98-37.14	2.27
.90-1.06	.06	12.98-13.14	.80	25.07-25.22	1.54	37.15-37.30	2.28
1.07-1.22	.07	13.15-13.30	.81	25.23-25.38	1.55	37.31-37.46	2.29
1.23-1.38	.08	13.31-13.46	.82	25.39-25.55	1.56	37.47-37.63	2.30
1.39-1.55	.09	13.47-13.63	.83	25.56-25.71	1.57	37.64-37.79	2.31
1.56-1.71	.10	13.64-13.79	.84	25.72-25.87	1.58	37.80-37.95	2.32
1.72-1.87	.11	13.80-13.95	.85	25.88-26.04	1.59	37.96-38.12	2.33
1.88-2.04	.12	13.96-14.12	.86	26.05-26.20	1.60	38.13-38.28	2.34
2.05-2.20	.13	14.13-14.28	.87	26.21-26.36	1.61	38.29-38.44	2.35
2.21-2.36	.14	14.29-14.44	.88	26.37-26.53	1.62	38.45-38.61	2.36
2.37-2.53	.15	14.45-14.61	.89	26.54-26.69	1.63	38.62-38.77	2.37
2.54-2.69	.16	14.62-14.77	.90	26.70-26.85	1.64	38.78-38.93	2.38
2.70-2.85	.17	14.78-14.93	.91	26.86-27.02	1.65	38.94-39.10	2.39
2.86-3.02	.18	14.94-15.10	.92	27.03-27.18	1.66	39.11-39.26	2.40
3.03-3.18	.19	15.11-15.26	.93	27.19-27.34	1.67	39.27-39.42	2.41
3.19-3.34	.20	15.27-15.42	.94	27.35-27.51	1.68	39.43-39.59	2.42
3.35-3.51	.21	15.43-15.59	.95	27.52-27.67	1.69	39.60-39.75	2.43
3.52-3.67	.22	15.60-15.75	.96	27.68-27.83	1.70	39.76-39.91	2.44
3.68-3.83	.23	15.76-15.91	.97	27.84-27.99	1.71	39.92-40.08	2.45
3.84-3.99	.24	15.92-16.08	.98	28.00-28.16	1.72	40.09-40.24	2.46
4.00-4.16	.25	16.09-16.24	.99	28.17-28.32	1.73	40.25-40.40	2.47
4.17-4.32	.26	16.25-16.40	1.00	28.33-28.48	1.74	40.41-40.57	2.48
4.33-4.48	.27	16.41-16.57	1.01	28.49-28.65	1.75	40.58-40.73	2.49
4.49-4.65	.28	16.58-16.73	1.02	28.66-28.81	1.76	40.74-40.89	2.50
4.66-4.81	.29	16.74-16.89	1.03	28.82-28.97	1.77	40.90-41.06	2.51
4.82-4.97	.30	16.90-17.06	1.04	28.98-29.14	1.78	41.07-41.22	2.52
4.98-5.14	.31	17.07-17.22	1.05	29.15-29.30	1.79	41.23-41.38	2.53
5.15-5.30	.32	17.23-17.38	1.06	29.31-29.46	1.80	41.39-41.55	2.54
5.31-5.46	.33	17.39-17.55	1.07	29.47-29.63	1.81	41.56-41.71	2.55
5.47-5.63	.34	17.56-17.71	1.08	29.64-29.79	1.82	41.72-41.87	2.56
5.64-5.79	.35	17.72-17.87	1.09	29.80-29.95	1.83	41.88-42.04	2.57
5.80-5.95	.36	17.88-18.04	1.10	29.96-30.12	1.84	42.05-42.20	2.58
5.96-6.12	.37	18.05-18.20	1.11	30.13-30.28	1.85	42.21-42.36	2.59
6.13-6.28	.38	18.21-18.36	1.12	30.29-30.44	1.86	42.37-42.53	2.60
6.29-6.44	.39	18.37-18.53	1.13	30.45-30.61	1.87	42.54-42.69	2.61
6.45-6.61	.40	18.54-18.69	1.14	30.62-30.77	1.88	42.70-42.85	2.62
6.62-6.77	.41	18.70-18.85	1.15	30.78-30.93	1.89	42.86-43.02	2.63
6.78-6.93	.42	18.86-19.02	1.16	30.94-31.10	1.90	43.03-43.18	2.64
6.94-7.10	.43	19.03-19.18	1.17	31.11-31.26	1.91	43.19-43.34	2.65
7.11-7.26	.44	19.19-19.34	1.18	31.27-31.42	1.92	43.35-43.51	2.66
7.27-7.42	.45	19.35-19.51	1.19	31.43-31.59	1.93	43.52-43.67	2.67
7.43-7.59	.46	19.52-19.67	1.20	31.60-31.75	1.94	43.68-43.83	2.68
7.60-7.75	.47	19.68-19.83	1.21	31.76-31.91	1.95	43.84-43.99	2.69
7.76-7.91	.48	19.84-19.99	1.22	31.92-32.08	1.96	44.00-44.16	2.70
7.92-8.08	.49	20.00-20.16	1.23	32.09-32.24	1.97	44.17-44.32	2.71
8.09-8.24	.50	20.17-20.32	1.24	32.25-32.40	1.98	44.33-44.48	2.72
8.25-8.40	.51	20.33-20.48	1.25	32.41-32.57	1.99	44.49-44.65	2.73
8.41-8.57	.52	20.49-20.65	1.26	32.58-32.73	2.00	44.66-44.81	2.74
8.58-8.73	.53	20.66-20.81	1.27	32.74-32.89	2.01	44.82-44.97	2.75
8.74-8.89	.54	20.82-20.97	1.28	32.90-33.06	2.02	44.98-45.14	2.76
8.90-9.06	.55	20.98-21.14	1.29	33.07-33.22	2.03	45.15-45.30	2.77
9.07-9.22	.56	21.15-21.30	1.30	33.23-33.38	2.04	45.31-45.46	2.78
9.23-9.38	.57	21.31-21.46	1.31	33.39-33.55	2.05	45.47-45.63	2.79
9.39-9.55	.58	21.47-21.63	1.32	33.56-33.71	2.06	45.64-45.79	2.80
9.56-9.71	.59	21.64-21.79	1.33	33.72-33.87	2.07	45.80-45.95	2.81
9.72-9.87	.60	21.80-21.95	1.34	33.88-34.04	2.08	45.96-46.12	2.82
9.88-10.04	.61	21.96-22.12	1.35	34.05-34.20	2.09	46.13-46.28	2.83
10.05-10.20	.62	22.13-22.28	1.36	34.21-34.36	2.10	46.29-46.44	2.84
10.21-10.36	.63	22.29-22.44	1.37	34.37-34.53	2.11	46.45-46.61	2.85
10.37-10.53	.64	22.45-22.61	1.38	34.54-34.69	2.12	46.62-46.77	2.86
10.54-10.69	.65	22.62-22.77	1.39	34.70-34.85	2.13	46.78-46.93	2.87
10.70-10.85	.66	22.78-22.93	1.40	34.86-35.02	2.14	46.94-47.10	2.88
10.86-11.02	.67	22.94-23.10	1.41	35.03-35.18	2.15	47.11-47.26	2.89
11.03-11.18	.68	23.11-23.26	1.42	35.19-35.34	2.16	47.27-47.42	2.90
11.19-11.34	.69	23.27-23.42	1.43	35.35-35.51	2.17	47.43-47.59	2.91
11.35-11.51	.70	23.43-23.59	1.44	35.52-35.67	2.18	47.60-47.75	2.92
11.52-11.67	.71	23.60-23.75	1.45	35.68-35.83	2.19	47.76-47.91	2.93
11.68-11.83	.72	23.76-23.91	1.46	35.84-35.99	2.20	47.92-48.08	2.94
11.84-11.99	.73	23.92-24.08	1.47	36.00-36.16	2.21	48.09-48.24	2.95

DOR-1980M (1-83)

6% OPTIONAL MISSOURI SALES USE TAX FORMULA

Sale	Tax	Sale	Tax	Sale	Tax	Sale	Tax
40.25-40.40	2.96	61.31-61.46	3.76	74.37-74.53	4.56	87.43-87.59	5.36
40.41-40.57	2.97	61.47-61.63	3.77	74.54-74.69	4.57	87.60-87.75	5.37
40.58-40.73	2.98	61.64-61.79	3.78	74.70-74.85	4.58	87.76-87.91	5.38
40.74-40.89	2.99	61.80-61.95	3.79	74.86-75.02	4.59	87.92-88.08	5.39
40.90-40.96	3.00	61.96-62.12	3.80	75.03-75.18	4.60	88.09-88.24	5.40
40.97-40.92	3.01	62.13-62.28	3.81	75.19-75.34	4.61	88.25-88.40	5.41
40.93-40.38	3.02	62.29-62.44	3.82	75.35-75.51	4.62	88.41-88.57	5.42
40.94-40.35	3.03	62.45-62.61	3.83	75.52-75.67	4.63	88.58-88.73	5.43
40.96-40.71	3.04	62.62-62.77	3.84	75.68-75.83	4.64	88.74-88.89	5.44
40.72-40.87	3.05	62.78-62.93	3.85	75.84-75.99	4.65	88.90-89.06	5.45
40.88-50.04	3.06	62.94-63.10	3.86	76.00-76.16	4.66	89.07-89.22	5.46
50.05-50.20	3.07	63.11-63.26	3.87	76.17-76.32	4.67	89.23-89.38	5.47
50.21-50.36	3.08	63.27-63.42	3.88	76.33-76.48	4.68	89.39-89.55	5.48
50.37-50.53	3.09	63.43-63.59	3.89	76.49-76.65	4.69	89.56-89.71	5.49
50.54-50.69	3.10	63.60-63.75	3.90	76.66-76.81	4.70	89.72-89.87	5.50
50.70-50.85	3.11	63.76-63.91	3.91	76.82-76.97	4.71	89.88-90.04	5.51
50.86-51.02	3.12	63.92-64.08	3.92	76.98-77.14	4.72	90.05-90.20	5.52
51.03-51.18	3.13	64.09-64.24	3.93	77.15-77.30	4.73	90.21-90.36	5.53
51.19-51.34	3.14	64.25-64.40	3.94	77.31-77.46	4.74	90.37-90.53	5.54
51.35-51.51	3.15	64.41-64.57	3.95	77.47-77.63	4.75	90.54-90.69	5.55
51.52-51.67	3.16	64.58-64.73	3.96	77.64-77.79	4.76	90.70-90.85	5.56
51.68-51.83	3.17	64.74-64.89	3.97	77.80-77.95	4.77	90.86-91.02	5.57
51.84-51.99	3.18	64.90-65.06	3.98	77.96-78.12	4.78	91.03-91.18	5.58
52.00-52.16	3.19	65.07-65.22	3.99	78.13-78.28	4.79	91.19-91.34	5.59
52.17-52.32	3.20	65.23-65.38	4.00	78.29-78.44	4.80	91.35-91.51	5.60
52.33-52.48	3.21	65.39-65.55	4.01	78.45-78.61	4.81	91.52-91.67	5.61
52.49-52.65	3.22	65.56-65.71	4.02	78.62-78.77	4.82	91.68-91.83	5.62
52.66-52.81	3.23	65.72-65.87	4.03	78.78-78.93	4.83	91.84-91.99	5.63
52.82-52.97	3.24	65.88-66.04	4.04	78.94-79.10	4.84	92.00-92.16	5.64
52.98-53.14	3.25	66.05-66.20	4.05	79.11-79.26	4.85	92.17-92.32	5.65
53.15-53.30	3.26	66.21-66.36	4.06	79.27-79.42	4.86	92.33-92.48	5.66
53.31-53.46	3.27	66.37-66.53	4.07	79.43-79.59	4.87	92.49-92.65	5.67
53.47-53.63	3.28	66.54-66.69	4.08	79.60-79.75	4.88	92.66-92.81	5.68
53.64-53.79	3.29	66.70-66.85	4.09	79.76-79.91	4.89	92.82-92.97	5.69
53.80-53.95	3.30	66.86-67.02	4.10	79.92-80.08	4.90	92.98-93.14	5.70
53.96-54.12	3.31	67.03-67.18	4.11	80.09-80.24	4.91	93.15-93.30	5.71
54.13-54.28	3.32	67.19-67.34	4.12	80.25-80.40	4.92	93.31-93.46	5.72
54.29-54.44	3.33	67.35-67.51	4.13	80.41-80.57	4.93	93.47-93.63	5.73
54.45-54.61	3.34	67.52-67.67	4.14	80.58-80.73	4.94	93.64-93.79	5.74
54.62-54.77	3.35	67.68-67.83	4.15	80.74-80.89	4.95	93.80-93.95	5.75
54.78-54.93	3.36	67.84-67.99	4.16	80.90-81.06	4.96	93.96-94.12	5.76
54.94-55.10	3.37	68.00-68.16	4.17	81.07-81.22	4.97	94.13-94.28	5.77
55.11-55.26	3.38	68.17-68.32	4.18	81.23-81.38	4.98	94.29-94.44	5.78
55.27-55.42	3.39	68.33-68.48	4.19	81.39-81.55	4.99	94.45-94.61	5.79
55.43-55.59	3.40	68.49-68.65	4.20	81.56-81.71	5.00	94.62-94.77	5.80
55.60-55.75	3.41	68.66-68.81	4.21	81.72-81.87	5.01	94.78-94.93	5.81
55.76-55.91	3.42	68.82-68.97	4.22	81.88-82.04	5.02	94.94-95.10	5.82
55.92-56.08	3.43	68.98-69.14	4.23	82.05-82.20	5.03	95.11-95.26	5.83
56.09-56.24	3.44	69.15-69.30	4.24	82.21-82.36	5.04	95.27-95.42	5.84
56.25-56.40	3.45	69.31-69.46	4.25	82.37-82.53	5.05	95.43-95.59	5.85
56.41-56.57	3.46	69.47-69.63	4.26	82.54-82.69	5.06	95.60-95.75	5.86
56.58-56.73	3.47	69.64-69.79	4.27	82.70-82.85	5.07	95.76-95.91	5.87
56.74-56.89	3.48	69.80-69.95	4.28	82.86-83.02	5.08	95.92-96.08	5.88
56.90-57.06	3.49	69.96-70.12	4.29	83.03-83.18	5.09	96.09-96.24	5.89
57.07-57.22	3.50	70.13-70.28	4.30	83.19-83.34	5.10	96.25-96.40	5.90
57.23-57.38	3.51	70.29-70.44	4.31	83.35-83.51	5.11	96.41-96.57	5.91
57.39-57.55	3.52	70.45-70.61	4.32	83.52-83.67	5.12	96.58-96.73	5.92
57.56-57.71	3.53	70.62-70.77	4.33	83.68-83.83	5.13	96.74-96.89	5.93
57.72-57.87	3.54	70.78-70.93	4.34	83.84-83.99	5.14	96.90-97.06	5.94
57.88-58.04	3.55	70.94-71.10	4.35	84.00-84.16	5.15	97.07-97.22	5.95
58.05-58.20	3.56	71.11-71.26	4.36	84.17-84.32	5.16	97.23-97.38	5.96
58.21-58.36	3.57	71.27-71.42	4.37	84.33-84.48	5.17	97.39-97.55	5.97
58.37-58.53	3.58	71.43-71.59	4.38	84.49-84.65	5.18	97.56-97.71	5.98
58.54-58.69	3.59	71.60-71.75	4.39	84.66-84.81	5.19	97.72-97.87	5.99
58.70-58.85	3.60	71.76-71.91	4.40	84.82-84.97	5.20	97.88-98.04	6.00
58.86-59.02	3.61	71.92-72.08	4.41	84.98-85.14	5.21	98.05-98.20	6.01
59.03-59.18	3.62	72.09-72.24	4.42	85.15-85.30	5.22	98.21-98.36	6.02
59.19-59.34	3.63	72.25-72.40	4.43	85.31-85.46	5.23	98.37-98.53	6.03
59.35-59.51	3.64	72.41-72.57	4.44	85.47-85.63	5.24	98.54-98.69	6.04
59.52-59.67	3.65	72.58-72.73	4.45	85.64-85.79	5.25	98.70-98.85	6.05
59.68-59.83	3.66	72.74-72.89	4.46	85.80-85.95	5.26	98.86-99.02	6.06
59.84-59.99	3.67	72.90-73.06	4.47	85.96-86.12	5.27	99.03-99.18	6.07
60.00-60.16	3.68	73.07-73.22	4.48	86.13-86.28	5.28	99.19-99.34	6.08
60.17-60.32	3.69	73.23-73.38	4.49	86.29-86.44	5.29	99.35-99.51	6.09
60.33-60.48	3.70	73.39-73.55	4.50	86.45-86.61	5.30	99.52-99.67	6.10
60.49-60.65	3.71	73.56-73.71	4.51	86.62-86.77	5.31	99.68-99.83	6.11
60.66-60.81	3.72	73.72-73.87	4.52	86.78-86.93	5.32	99.84-99.99	6.12
60.82-60.97	3.73	73.88-74.04	4.53	86.94-87.10	5.33	100.00-100.16	
60.98-61.14	3.74	74.05-74.20	4.54	87.11-87.26	5.34		
61.15-61.30	3.75	74.21-74.36	4.55	87.27-87.42	5.35		

WORKSHEET

FIGURING DISCOUNTS

There are four main types of discounts used by agribusinesses. The first type, a cash discount, is given if the customer pays cash at the time of delivery of the merchandise. There are advantages to the agribusiness; the money from the sale can be reinvested immediately. They usually range from 1 - 3% and are applied after all other discounts have been deducted.

The second type, a quantity discount, is given for buying a large volume of merchandise. This can be more economical to an agribusiness because it is usually less expensive to handle a large quantity at once, instead of a series of small orders. These discounts are usually on tons of feed or fertilizer, or items bought in large barrels or drums.

The third type, a bulk discount, is like buying a truckload of corn seed instead of buying individual sacks. These, like quantity discounts save on time and energy spent, therefore, saving money.

The fourth type, early season discounts, are for purchasing merchandise before the season in which it is used. This can save the agribusiness storage space and help them identify how much to order ahead of time.

EXAMPLE PRICING POLICY OF AN AGRIBUSINESS (discounts)

QUANTITY DISCOUNTS (tonnage)

Fertilizer Discount:	
5 to 10 ton order	\$2.00 per ton discount
11 to 15 ton order	\$6.00 per ton discount
16 tons or over	\$10.00 per ton discount

Feed Discounts:	
1 to 5 tons	\$2.00 per ton discount (plus \$8 per ton bulk)
6 to 10 tons	\$4.00 per ton discount (plus \$12 per ton bulk)
11 tons or more	\$6.00 per ton discount (plus \$16 per ton bulk)

EARLY SEASON DISCOUNTS

Delivery	Twine	Fertilizer	Seed
December	\$1 per bale	\$6 per ton	\$4 per bu.
January	\$.80 per bale	\$5 per ton	\$3 per bu.
February	\$.60 per bale	\$4 per ton	\$2 per bu.
March	\$.40 per bale	\$3 per ton	N/A
April	\$.20 per bale	N/A	N/A

CASH DISCOUNTS

2% cash discount allowed when payment is made at the time of delivery or pickup.

Several discounts may apply on the same sale. It is possible to use Tonnage, Early Order, and Cash Discount on the same purchase.

Deduct early season and tonnage discounts before cash discounts.

In figuring fractions of a cent, carry forward 1/2 cent or more, and drop less than 1/2 cent.

SOURCE: Agribusiness Sales and Marketing, p. 398, 401.

WORKSHEET

PROBLEMS IN FIGURING DISCOUNTS AND TERMS OF SALE

Using AB #3 complete the following problems:

1. December delivery:

8 tons 12-12-12 fertilizer at \$215 per ton
10 bales of baling twine at \$21.65 per bale
Did not pay cash at time of delivery

Total \$ _____

2. January delivery:

4 tons of bulk 42% dairy supplement at \$252 per ton
6 bushels Ranger alfalfa seed at \$92.30 per bushel
Paid cash at time of delivery

Total \$ _____

3. February delivery:

12 tons of 5-20-20 fertilizer at \$185 per ton
10 bushels seed corn at \$45 per bushel
Paid cash at time of delivery

Total \$ _____

4. March delivery:

6 tons 5-20-20 fertilizer at \$185 per ton
10 bales of baling twine at \$21.65 per bale
5 bushels of Ranger alfalfa seed at \$92.30 per bushel
Did not pay cash at time of delivery

Total \$ _____

5. Joe Smith, the local fertilizer co-op manager, purchased 50 tons of 5-20-20 fertilizer and on the top of his invoice he received from the manufacturer it had "1/15; net 30." The total of the invoice was \$7500. Mr. Smith paid 10 days after receiving the invoice.

Total \$ _____

SOURCE: Agribusiness Sales and Marketing, p. 407.

WORKSHEET

AGRIBUSINESS CUSTOMER TRANSACTIONS

Figuring Sales Tax

Every local agribusiness must charge sales tax. The amount of sales tax in the state of Missouri depends on how much is added at the local level to the state tax of 4% and the state conservation tax of .125%. Both the county and the city you live in may charge a tax. For example, one city charges a 1.5% sales tax, and the local county charges a .5% sales tax. This means goods sold in this city are charged a total tax of 6.125%.

You may obtain a local sales tax table form your local department of revenue like the one provided (AB worksheet #2). The intent of the sales tax law is that products will only be charged sales tax once. Therefore, a product will be exempt (not charged a sales tax) if it is used to produce a final item which is sold, as long as the cost of the product is included in the final sale of the item. The bottom line for those involved in agriculture is that anything used in the production process is exempt from sales tax with some exceptions. For example, if you buy grass seed for your pasture, it will be exempt, but if you buy grass seed for your lawn, it is not exempt.

Most agricultural machinery used for production is exempt, like tractors, combines, and haybines. However, some pieces of equipment are not, such as storage devices and containers, hand tools (which means strictly hand powered), and accessories, such as radios, air conditioners, and cigarette lighters for your equipment. Please examine the accompanying sheets AB #6 (taxable and exempt sales) for further listing of items.

Also, the usage of some items may determine if they are exempt. This means if items become a permanent part of real estate or buildings, it will be subject to sales tax. For example, drain tile used in a field to increase production of crops for a sale is exempt. However, the same type of drain tile used in a farrowing house for drains is non-exempt.

Some organizations are exempt from sales tax. They are charitable and religious organizations, government agencies such as schools, public utility companies, cities, etc.

Sales tax exemptions are handled in the agribusiness by certificates of exemption. The first type, a blanket certificate is signed by the customer and kept on file at the agribusiness for all future purchases by the customer. The second type, a unit certificate is usually part of the sales ticket and exempts only those items on the ticket, and must be signed each time there is a purchase.

The two main points that determine if an item is exempt from sales tax is whether it is used directly for production, and that its use does not become a permanent part of real estate or a building.

SOURCE: Agribusiness Sales and Marketing, p. 397.

WORKSHEET

EXEMPT SALES-- (Schedule A)

These items are exempt only if used exclusively for agricultural purposes, on land owned or leased for the purpose of producing farm products, and used directly in producing farm products or livestock to be sold ultimately at retail.

Artificial insemination equipment
Augers

Bailers
Bale transportation equipment
Binders
Bins, grain, portable
Blowers
Brooders
Bulk milk coolers
Bulk milk tanks

Calf weaners and feeders
Cattle currying and oiling machine
Cattle feeders, portable
Chain saws for commercial use in
harvesting timber, lumber, and in
orchard pruning
Chicken pluckers, portable
Choppers
Combines
Conveyors, portable
Corn pickers
Crawlers, tractor
Crushers
Cultipackers
Cultivators

De-beakers for productive animals
De-horners for productive animals
Discs
Drags
Dryers
Dusters

Egg handling equipment
Ensilage cutters

Farm tractors
Farm wagons

Hog feeders, portable
Hoists, farm
Husking Machines
Hydro-coolers

Incubators, portable
Irrigation equipment

Livestock feeding, watering
and handling equipment,
portable

Manure handling equipment
(including front end and
rear end loaders and blades)

Manure spreaders
Milk cans
Milk coolers
Milk strainers
Milking equipment (including
bulk milk refrigerators,
coolers and tanks)
Milking machine
Mowers, hay and rotary blade

Pickers
Planters
Plows
Poultry feeder, portable
Poultry house equipment
Pruning and picking equipment

Refrigerators used to cool
raw milk
Repair and replacements parts
for exempt machinery
Rollers
Root vegetable harvesters
Rotary blade mowers
Rotary hoes

WORKSHEET

EXEMPT SALES - (Schedule A, cont.)

Farrowing houses, portable,
and crates
Feed carts
Feed grinders
Feeders
Fertilizer distributors
Foggers
Forage boxes
Forage harvester
Fruit graters
Fruit harvester

Grain augers
Grain binders
Grain bins, portable
Grain conveyors
Grain drills
Grain elevators, portable
Grain handling equipment
Grain planters

Harrows (including spring-tooth
harrow)
Hay loaders
Head gates

Seeders
Seed cleaners
Seed planters
Shellers
Silo unloaders
Sorters
Sowers
Sprayers
Spreaders
Squeeze chutes
Subsoilers

Tanks, bulk milk
Threshing machines
Tires for exempt machinery
Tillers
Tractors, farm

Vacuum coolers
Vegetable graders
Vegetable washers
Vegetable waxers

Wagons, farm
Washers, fruit, vegetable,
and egg
Waxers
Weeders

WORKSHEET

TAXABLE SALES - (Schedule B)

Air compressors
Air tanks
Anti-freeze
Automobiles
Axes

Baler twine
Barn ventilators
Binder twine
Bins, permanently installed
Brooms
Brushes
Building materials and supplies

Cattle feeders, permanently installed
Cement
Chain saws
Cleansing agents and materials
Construction tools
Conveyors, permanently installed
Cow stalls

Ear tags
Electrical wiring
Equipment for fire protection
Equipment and supplies for home
or personal use

Fans
Fence building tools
Fence posts
Field toilets
Fire prevention equipment
Fuel additives

Garden hose
Garden rakes and hoes
Gasoline tanks and pumps
Grain bins, permanently installed
Greases and oils

Hand tools
Hammers
Heaters
Hog rings
Hog ringers
Hose, garden

Lamps
Lanterns
Lawnmowers
Lightbulbs
Lubricating oils and grease

Marking chalk

Nails

Office supplies and equipment

Packing room supplies
Personal property installed in or
used in housing for farm workers
Post hole diggers
Pumps, gasoline
Pumps for household or lawn use

Refrigerators for home use
Repair tools
Road maintenance equipment
Road scraper
Roofing

Sanders
Shovels
Silos
Small tools
Snow fence
Snow plows and snow equipment
Stalls
Stanchions
Staples
Supplies for home or personal use

Tanks, air
Tanks, gasoline
Toilets, field
Tools for repair construction
Tractors, garden

Water hose
Welding equipment
Wire, fencing
Wrenches

WORKSHEET

PROBLEMS IN FIGURING SALES TAX

For figuring sales tax, use your local tax rate of ____%.
Assume tax is to be charged on all items.

1. 50# bag of dog food, \$10.80 _____
2. Fifty 50# bags of fertilizer at \$7 each _____
3. 40 rods of fence at \$4 per rod _____
4. 200 concrete blocks at \$.56 each _____
5. Electric clippers, \$34.50 _____
6. Order of garden seeds, \$15.30 _____
7. 2 scoop shovels at \$13.95 each _____
8. Power lawnmower, \$243 _____
9. 50# of wild birdseed, \$5.20 _____
10. Lumber for repairs, \$125.80 _____

In the following examples, determine if the tax should be charged, and how much it should be.

11. 1,000 feet of field tile at \$500 per thousand feet for repair of tile lines in cornfields _____
12. Electric fence unit at \$45.95 for a temporary electric fence _____
13. 500 concrete blocks for milk parlor wall at \$.56 each _____
14. One roll of yard fence at \$42 _____
15. Two rolls of picket cribbing for temporary corn crib at \$21.00 each _____
16. 20 bales of baler twine at \$19.65 each _____
17. 5 bushels of alfalfa seed at \$92.30 per bushel _____
18. 10# of lawn seed at \$1.05 per lb. _____
19. 10 tons of 5-20-20 fertilizer for corn at \$149.82 per ton _____
20. 25 sections of sewer tile at \$2.70 each for septic tank drain _____

SOURCE: Agribusiness Sales and Marketing, p. 405.

WORKSHEET

MAKING CHANGE

Most employees, no matter what their position at an agribusiness, will have to handle money and it is always good to know the proper steps in making change for the customers. The following are steps that show you how to make change. These steps will help you avoid making mistakes that will make your customers lose confidence in the agribusiness and possibly cost your company money.

1. State the amount given to you by the purchaser and the amount of the sale. For example, "That is \$3.50 out of \$5.00".
2. Place the amount received from the customer on the ledge of the cash register. This will help answer any questions that might come up about what size bill the customer gave you.
3. Use the addition method of making change. Starting with the amount of the sale, add up the change to the amount received from the customer. Use the least amount of coins and bills as possible. Counting should be done out loud so the customer can follow the transaction.
4. Give the receipt to the customer.
5. Place the money received in its proper compartment in the register drawer and close it. This should be done only after the customer is satisfied with the transaction.
6. Package the merchandise and give it to the customer. You could attach the receipt to the package.
7. To avoid confusion, requests such as exchanging coins for bills should be handled after the transaction is completed.

WORKSHEET

MAKING CHANGE - PRACTICE

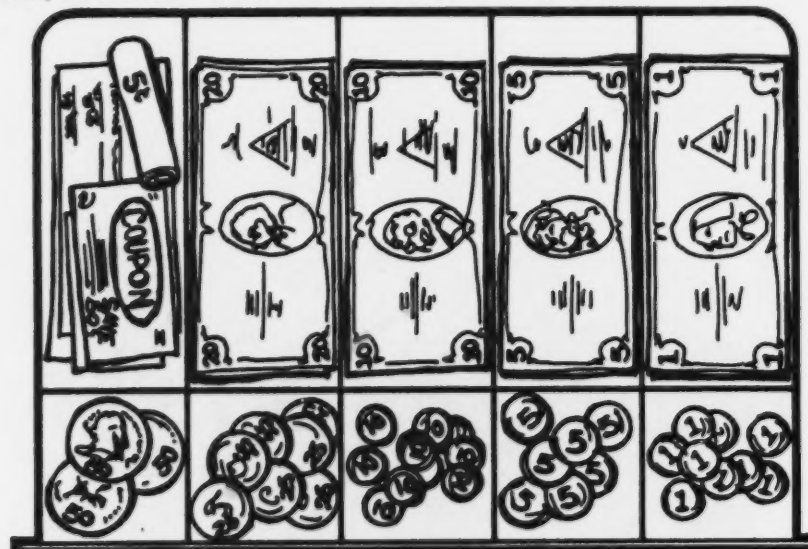
Cashiers and sales clerks use the addition method in making change. Suppose a customer gives a \$20 bill to pay for a purchase totaling \$5.51 on the cash register. Included below are the steps for making change.

1. You accept the \$20 from the customer and place it on the change plate of the cash register.
2. Think to yourself how much change is needed to build to \$20 from \$5.51, using as few coins as possible. In this case it would be:

4 pennies	4 one-dollar bills
2 dimes	1 ten-dollar bill
1 quarter	

3. Starting with \$5.51, count aloud the return of the change.
4. Before closing the drawer, place \$20 in the correct section. Use the illustration below for correct drawer placement.

ROLLS,
CHECKS, COUPONS TWENTIES TENS FIVES ONES



HALF DOLLARS QUARTERS DIMS NICKELS PENNIES
FRONT

Making Change

Cashiers and sales clerks are expected to do more than just run a register. They also are required to do various types of arithmetic problems demonstrated in these problems:

1. A woman hands you 7 half-dollars, 18 quarters, 5 dimes, 14 nickels, and 28 pennies. She purchases an item for \$9.45. What is her change?
2. A man brings in 5 half-dollars, 7 quarters, 27 dimes, 3 nickels, and 87 pennies. How much more does he need to purchase an item costing \$10.98?
3. Shirts sell three for \$9.98. A woman has \$5. How many shirts can she buy?
4. A woman has three items on lay-away. The items cost \$3.98, \$6.47, and \$15.98. She has put \$10.00 down to hold them. She hands you a \$20.00. What is her change?
5. A woman has given you three \$10 bills. She bought two items costing \$15.98 and \$7.49. She hands you a \$20 bill. What is her change?
6. A woman brings in an item costing \$5.98 to exchange for one costing \$9.98. She hands you a \$20 bill. What is her change?
7. Shirts are selling three for \$9.33. A woman wants to buy two. How much does she have to pay?
8. Shirts selling for \$10.00 each are marked 25% off. A man wants to buy five. How much money does he need?
9. A woman exchanged three items costing \$1.98, \$6.98, and \$10.39. She then bought two items costing \$15.97 and \$5.95. She hands you a \$10 bill. What is her change?
10. A man bought six items costing \$10.98, \$12.98, \$5.50, \$2.96, \$27.35, and \$106.49. What is his total bill?

WORKSHEET

AB #9A

Making Change (continued)

Use as few coins and bills as possible.

Enter the number of coins and bills only. The first one is done for you.

Denomination:	\$.01	\$.05	\$.10	\$.25	\$.50	\$1	\$5	Total
\$2.71 out of \$ 5.00	4			1		2		2.29
\$.19 out of \$.50								
\$1.31 out of \$ 5.00								
\$.79 out of \$ 1.00								
\$.37 out of \$10.00								
\$.22 out of \$.50								
\$7.57 out of \$ 7.75								
\$3.03 out of \$ 5.03								
\$2.76 out of \$10.00								
\$1.57 out of \$ 3.00								
\$.53 out of \$.75								
\$2.01 out of \$ 2.50								
\$8.53 out of \$10.00								

ANSWERS FOR MAKING CHANGE WORKSHEETS

Worksheet AB #9A

Denomination:	\$.01	\$.05	\$.10	\$.25	\$.50	\$1	\$5	Total
\$2.71 out of \$ 5.00	4			1		2		\$2.29
\$.19 out of \$.50	1	1		1				.31
\$1.31 out of \$ 5.00	4	1	1		1	3		3.69
\$.79 out of \$ 1.00	1		2					.21
\$.37 out of \$10.00	3		1		1	4	1	9.63
\$.22 out of \$.50	3			1				.28
\$7.57 out of \$ 7.75	3	1	1					.18
\$3.03 out of \$ 5.03						2		2.00
\$2.76 out of \$10.00	4		2			2	1	7.24
\$1.57 out of \$ 3.00	3	1	1	1		1		1.43
\$.53 out of \$.75	2		2					.22
\$2.01 out of \$ 2.50	4		2	1				.49
\$8.53 out of \$10.00	2		2	1		1		1.47

Worksheet AB #9

- | | | | |
|-----------|------------|------------|--------------|
| 1. \$.03 | 4. \$3.57 | 7. \$6.22 | 10. \$166.26 |
| 2. \$3.01 | 5. \$6.53 | 8. \$37.50 | |
| 3. one | 6. \$16.10 | 9. \$7.43 | |

AGRIBUSINESS

Physical Demands/Working Environment

Lift 20 lbs. maximum with frequent lifting and/or carrying of objects weighing up to 10 lbs. (light work)
Extend the hands and arms in any direction (reaching)
Seize, hold, grasp, turn or otherwise work with the hand or hands (handling)
Pick, pinch, or otherwise work with the fingers (fingering)
Perceive size, shape, temperature or texture of objects and materials by using fingertips (feeling)
Ability to work inside

In most cases, the assessment of these skills will indicate that the student has the gross and fine motor skills which are prerequisites to learning the vocational skills in an Agribusiness program. Prior to instruction in any physical demands activities, the student should have been evaluated and parents contacted to make sure that the student has no hidden physical problems that could be aggravated by lifting objects or by other physical activities done in this area. However, if the student has a physical disability or other limitation(s) preventing him/her from demonstrating fine and gross motor skills, then other techniques may be taught so he/she can perform in the vocational program. Other persons to use as resources in this area include: physical education teacher, industrial arts teacher, special education teacher, and parents.

Provide an extensive background for students on the importance of doing physical skills correctly and carefully. A variety of outside resources such as the following are available.

- a. Speaker from OSHA who would address the number of accidents that occur each year due to workers not protecting their bodies by using proper lifting techniques or overextending themselves. Have them relate to the agribusiness profession.
 - b. Have the school nurse or health care worker demonstrate what happens to a person's body when they lift heavy objects and how the students can build bodies up to being able to lift necessary objects on the job.
 - c. Videotapes are helpful. National Safety Council has helped develop an eight minute film entitled, "A New Way to Lift," which can be rented from the University of Missouri-Columbia Academic Support Center.
1. Student will demonstrate proper lifting techniques. Go over the details in Worksheet AB #10 that provide step-by-step instruction on proper lifting techniques.

2. Student will develop a list of types of materials and activities which might be required to lift and/or do in an Agribusiness setting. To help student develop this list a film on Agribusiness as a career might be available from student's high school, local farm cooperative or extension services. Student may view film and list physical activities done by actors. Student should be instructed to look for both gross and fine motor activities. If a film is not available a visit to the local agribusiness facility might be arranged.
3. Student will practice lifting and carrying objects of 10 to 20 pounds in weight. Provide student with agribusiness catalogs available from the local store or extension division. Ask student to identify 10 to 20 items that weight up to 20 pounds in the catalog that someone in agribusiness might be asked to carry. Have student locate four or five objects in the classroom that appear to be about the same size and weight as some of the items identified in the catalog. Have student practice using proper lifting, carrying and replacement procedures with these items. Explain to student that much of the physical work they do will involve setting up displays and carrying samples to and from their car.
4. Student will demonstrate ability to reach in a variety of situations.
5. Student will develop a list of reaching activities that would be part of an agribusiness person's job. For example:
 - a. getting materials from trunk of car
 - b. putting goods on display
 - c. putting up poster, signs, etc.
6. Given a variety of small articles found in an agribusiness store, student will sort according to item. The local MFA store should have a large variety of items to select and choose from. If these items cannot be found at home or school, then provide student with items such as tacks, clips, nuts, bolts, etc. so he/she may have practice sorting and using fine motor skills.
7. Student will demonstrate reaching ability. Based on earlier discussions of physical activities in agribusiness, student will develop a list of types of activities that would require reaching. In a simulation activity, student will demonstrate these reaching requirements. These activities should include reaching while in a bending, stooped, and tiptoe stance.
8. Student will identify items found in an agribusiness store by texture and color.
9. Student will sort, stack and wrap coins according to teacher demonstration. Local banks will supply coin wrappers. Instruct student in how to use one and two fingers to sort and count money.

SUGGESTIONS FOR PARENTS:

1. Provide student with the opportunity to lift and move light weight items around the home. Have student demonstrate proper lifting techniques to family.
2. Have student draw a design on how he/she would like to arrange a section of the home to best display a certain item. Allow student to follow through to determine how effective the display idea was.

WORKSHEET

PROPER LIFTING TECHNIQUES WORKSHEET

1. Size up the load to be lifted. Do not even attempt to lift a large load alone. If you have any doubt about your ability to lift an object, ask for assistance.
2. Make sure you are well-balanced. Your feet should be apart to give you a broad base of support if you are lifting a heavy object or person.
3. Move close to what you are to lift. Do not reach for any object that is up high or over far. Get your body close to the object to be lifted. If it is up high, get on a ladder. (Use the proper method of climbing a ladder. See the Safety Module.)
4. Keep your back straight. Line up your back so you don't strain it. Bend at the knees and hips--NOT the back.
5. As you lift, straighten your legs. When you bend to lift something, bend your knees. To lift it, straighten your legs.
6. If you need to turn, shift the position of your feet, but do NOT turn your body. Twisting injures muscles.
7. If you are lifting with someone, lift smoothly. This avoids strain on your back which you would get from jerky movements. Count with the person to make sure the lift is smooth.
8. Push or pull a heavy object whenever possible. It is easier and safer.
9. Remember to use these skills all of the time to keep yourself safe.

AGRIBUSINESS

Aptitudes - indicates an ability to:

coordinate eyes and hands or fingers rapidly and accurately (K-motor coordination)
make a movement response accurately and swiftly (K-motor coordination)
move the fingers and manipulate small objects with the fingers, rapidly or accurately (F-finger dexterity)
move the hands easily and skillfully (M-manual dexterity)
work with the hands in placing and turning motions (M-manual dexterity)

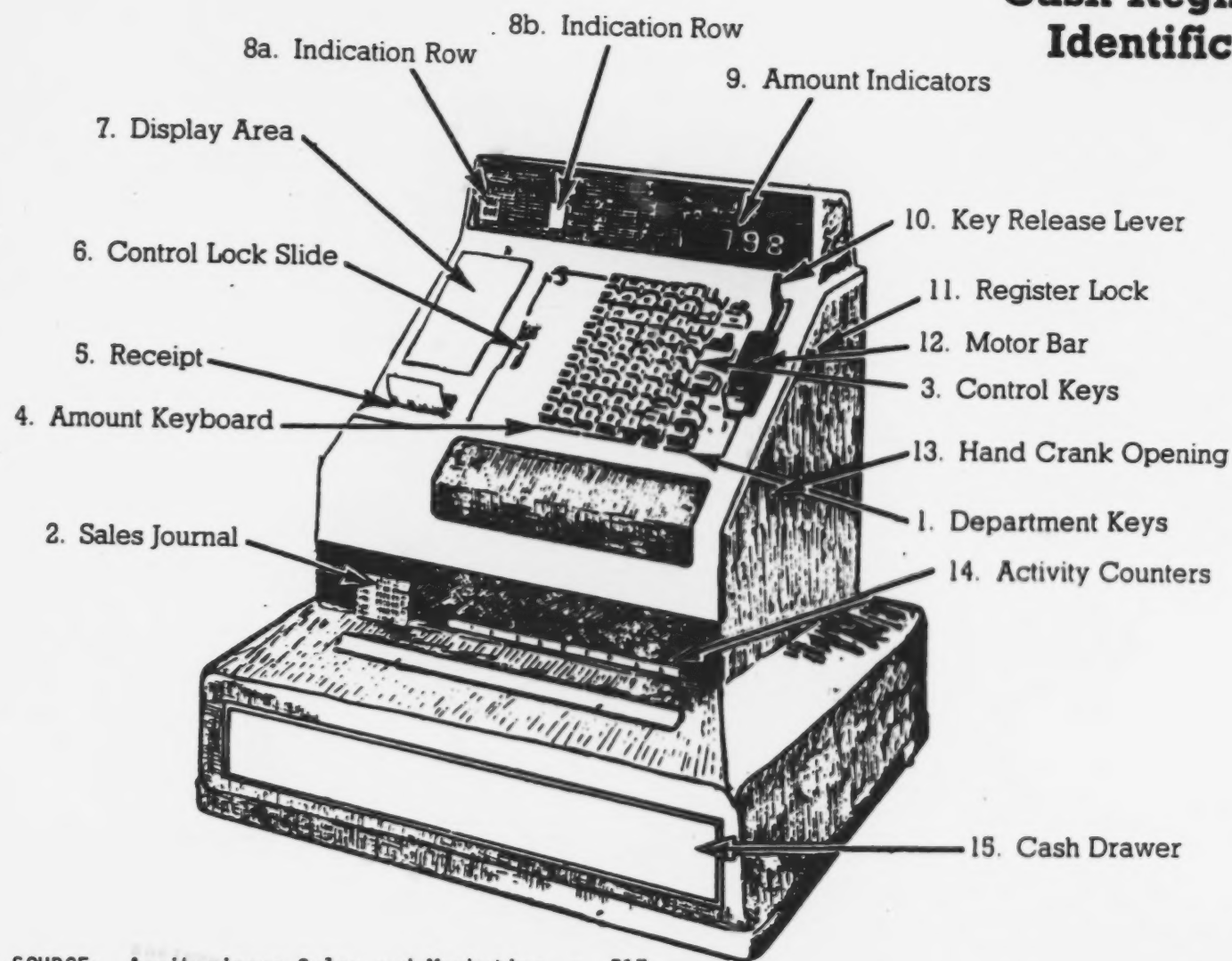
1. Using Worksheet AB # 11, 12 & 13, student will identify and fill in names for components of a cash register.
2. Student will review with the teacher the proper procedure for using a cash register for computing sales. See worksheet AB #14.
3. Student will use cash register to add items and compute total sale including taxes. Most schools have access to a cash register in the cafeteria. Arrangements can be made to use this.
4. Given Worksheet AB # 15, student will compute sales. Explain that some items have X's beside them because they are "non taxable" items. Explain that this means the farmer does not have to pay taxes on these items because they will be used to grow a product that will later be sold as a taxable item.
5. Student will role play ringing up customer sales. Using appropriate eye-hand coordination as well as appropriate communications skills should be part of this role play activity.
6. Student will identify and describe different parts of an adding machine. See Worksheet AB #16 & 17.
7. Student will identify basic parts of an electronic calculator. See Worksheet AB # 18.
8. Student will identify main functions of parts of an electronic calculator. See Worksheet AB # 19.
9. Student will use proper fingering techniques when using an electronic adding machine or calculator. See Worksheet AB #20.
10. Student will demonstrate proper techniques in using the adding machine and electronic calculator. See Worksheet AB # 21.
11. Student will perform mathematical procedures using the adding machine. See Worksheet AB # 22.

12. Student will perform mathematical procedures using the electronic calculator. See Worksheets AB # 23 a & b.
13. Student will participate in relays using the adding machine or calculator.
14. For more basic instruction on using a calculator refer to the instructional module "Use a Calculator" in ACCESS SKILLS: Employability and Study Skills Assessment and Curriculum Guide.
15. If possible have student run cash register with guidance in the cafeteria lines during breaks or lunch.
16. Student will practice using the adding machine and electric calculator. See Worksheets 24 a & b.

SUGGESTIONS FOR PARENTS:

1. Provide student with a simple calculator and allow him/her to total several grocery bills. Check his/her total and tax computation with the receipts.
2. Have student go shopping with you to determine best buys, mark down totals on sale items, etc.

Cash Register - Identification

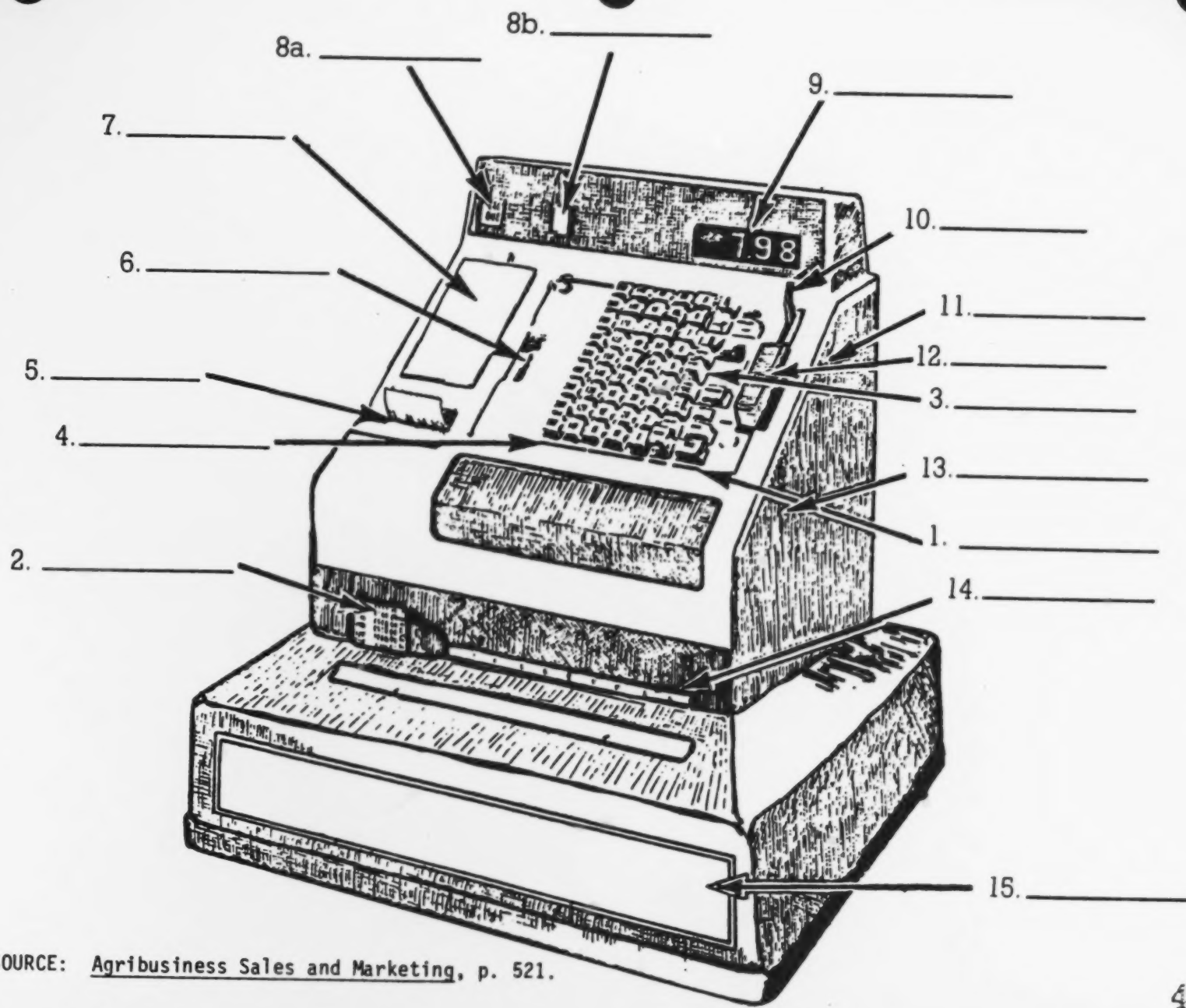


SOURCE: Agribusiness Sales and Marketing, p. 517.

41

AB #11

41



SOURCE: Agribusiness Sales and Marketing, p. 521.

WORKSHEET

USE OF THE CASH REGISTER

The cash register is a very useful tool in any business, and it is not difficult to learn to operate. Not all cash registers are alike, but the principles of operation are similar once you learn to recognize the major parts. The handout shows the major parts of a cash register.

Item 1 - Department Keys

One of these is depressed as a sale is rung up on the cash register. In an agricultural business, this may be the feed department or the equipment department, or others.

Item 2 - Sales Journal

A tape with a record of each sale rung up on the cash register. Each sale is numbered on the tape.

Item 3 - Control Keys

These keys indicate whether the sale is cash or charge, or some other control code. The machine on AB #11 has a "total" key in this group to total the amount of the sale. Another key labeled "amount received" is depressed after the amount the customer gives you is entered in the amount keyboard. The "change" key is then depressed, and the balance due to the customer is indicated on the "amount indicators."

Item 4 - Amount Keyboard

The amount of each item is entered separately, and then the motor bar (Item 12) is depressed before the amount of the next item is entered.

Item 5 - Receipt

The receipt is fed out of the machine for the customer. The number "0098" and the total is registered on the sales journal.

Item 6 - Control Lock Slide

The manager usually carries the key for the control lock slide. The cash register will provide the manager with a total for each department when the key is inserted for reading these totals. Without the key the register cannot be reset, thus offering protection for the manager.

Item 7 - Display Area

This area is sometimes used to tape on key codes for departments or other information for the cashier.

Item 8 - Indication Rows

As each item is rung on the cash register, the department or type of sale is indicated in these indication rows.

Item 9 - Amount Indicators

Each item rung on the cash register is shown in the amount indicator window. The total is also shown for the convenience of making proper change.

Item 10 - Key Release Lever

If a mistake is made entering an amount on the keyboard, the lever is pulled out, causing the punched keys to pop out. The new amount is then entered.

Item 11 - Register Lock

If a cashier is not at the cash register at all times, the register is locked to prevent nonemployees or nonqualified employees from ringing up sales and opening the cash drawer.

Item 12 - Motor Bar

After the amount is entered on the amount keyboard and the department and control keys are depressed, the motor bar enters this information into the cash register.

Item 13 - Hand Crank Opening

If the electricity goes out, a hand crank can be inserted in this opening to register the items in the cash register.

Item 14 - Activity Centers

Each time an item is entered for a particular department the sale is registered and counted. The cashier can tell at a glance how many items were sold out of each payment.

Item 15 - Cash Drawer

The cash drawer doesn't open until either the total or balance due the customer is registered in the amount indicator, depending upon the type of cash register.

WORKSHEET

APTITUDES - CASH REGISTER

1. Operating the Cash Register

a) Example: A customer bought one shovel for \$8.75, one screwdriver set for \$12.95, and two candy bars for \$0.45. Steps of operation:

1. Depress the employee key.
2. Punch in \$8.75.
3. Punch taxable item key.
4. Punch \$12.95.
5. Punch taxable item key.
6. Punch in \$0.45.
7. Punch in taxable item key.
8. Punch in \$0.45.
9. Punch in taxable item key.
10. Punch tax total key. The total will show in the amount indicator.
11. Compute the tax (For example, $0.06125 \times 22.60 = 1.38$).
12. Punch in \$1.38.
13. Punch tax key.
14. Punch taxable group key. the net amount of \$23.98 will show in the amount indicator.
15. Record the amount given to you as a twenty and a five dollar bill. (Punch in \$25.00.)
16. Punch amount tendered key.
17. Punch change balance due key.
18. Amount indicator will show change owed (\$1.02).

2. Other important procedures to remember:

- a) To make a blank operation (for example, to give someone change), you press the change balance key to open the drawer.
- b) Remember that in agriculture many items may be nontaxable so that you will not press the taxable item key for those items.
- c) Must first depress the employee key before department or transaction keys.
- d) Transaction keys allow for coupons or refunds. They will automatically print the type of transaction on the receipt and the sales journal in the cash register. These keys will stay down until released.

- e) Correcting errors:
 - (1) If you press the wrong key in the amount columns, pull out the key release lever and repunch the correct amount.
 - (2) If the department key has already been punched, the incorrect amount will be printed and you must follow the agribusiness policy for correction.
- f) Give the receipt to the customer. It usually has the following information: date, amount, employee code, consecutive number, department, kind of transaction, and may contain the business' name.

WORKSHEET

PROBLEMS FOR USING A CASH REGISTER

For the following problems, assume 6% sales tax; also assume that nontaxable items will be indicated.

<u>Customer</u>	<u>Nontaxable</u>	<u>Description of Item</u>	<u>Quantity</u>	<u>Price</u>	*
1	X	Soybean meal	800 lbs.	16.20	cwt.
		Eartags	100	1.10	ea.
		Antifreeze	5 gal.	3.20	gal.
2	X	5-20-20 fertilizer	5 tons	196.85	ton
	X	Seed Wheat	150 bu.	10.35	bu.
		Hammer	2	8.50	ea.
3	X	100# salt blocks	5	8.98	ea.
	X	5 gal. of flyspray	1	32.41	ea.
		case of grease cartridges	1	24.00	
4	X	24 volt tractor battery	1	80.65	
		Muffler for pickup	1	46.20	
		Baler twine	20 bales	27.83	ea.
5	X	Tractor tires	2	468.40	ea.
		5 gal. hydraulic fluid	1	82.40	
	X	Bearing for combine	1	37.50	
6		Bedding plant flat	10	1.69	ea.
		Hand trowel	1	6.49	
		Sack of mulch	2	2.69	ea.
7		Lopping shears	1	18.50	
		Hand pruner	1	8.95	
		Can of tree paint	2	6.80	ea.
8		Chainsaw	1	486.60	
		Chain files	5	1.05	ea.
		2 1/2 gal. gas can	1	10.95	
9		Air compressor	1	499.99	
		10-2 electrical wire with ground box	2 rolls	26.80	ea.
		Electrical receptacle	10	2.95	ea.
10	X	Cottonseed meal	1800 lbs.	18.33	cwt.
	X	Alfalfa seed	3 bu.	98.20	bu.
		Gloves	2 pairs	5.69	ea.

* means for each 100 pounds

SOURCE: Agribusiness Sales and Marketing, p. 523.

WORKSHEET AB #15 ANSWER KEY

* nontaxable item total

1. \$110.00
16.00
 126.00
7.56
 133.56
129.60 *
 263.16

7. \$18.50
8.95
 13.60
41.05
2.46
 43.51

2. \$ 984.25 17.00
1,552.50 1.02
 2,536.75 18.02
18.02
 2,554.77

8. \$486.60
5.25
10.95
 502.80
30.17
 532.97

3. \$ 44.90 24.00
32.41 1.44
 77.31 * 25.44
25.44
 102.75

9. \$499.99
53.60
29.50
 556.54
33.39
 589.93

4. \$ 80.65 46.20
638.97 556.60
 718.52 602.80
36.17
 638.97

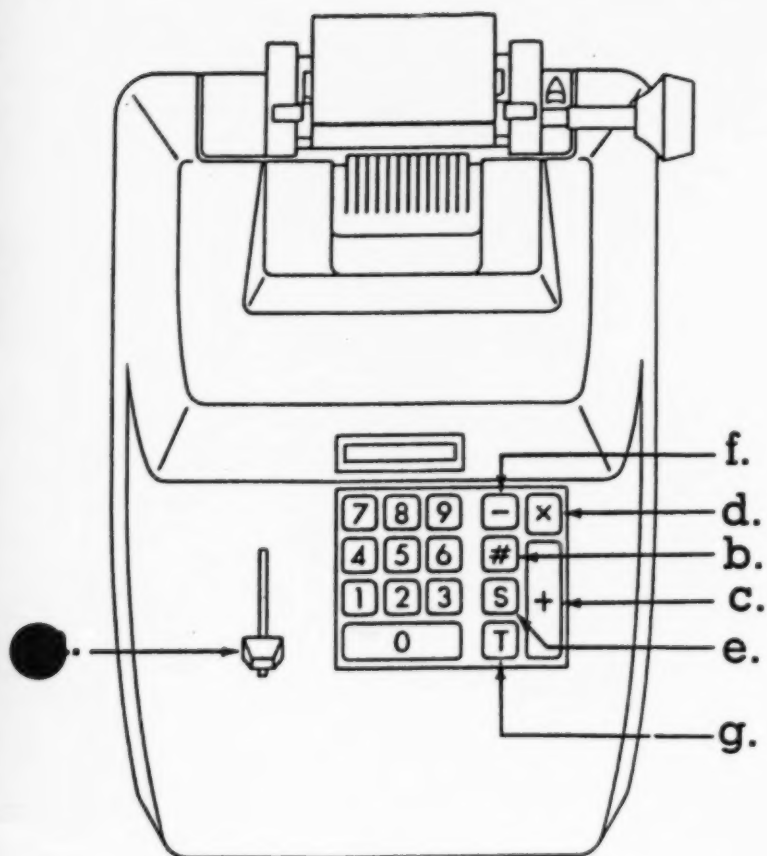
10. \$329.94
294.60
 624.54
37.47
 662.01
11.38 *
 673.39

5. \$ 936.80 82.40
37.50 4.94
 974.30 87.34
87.34
 1,061.64

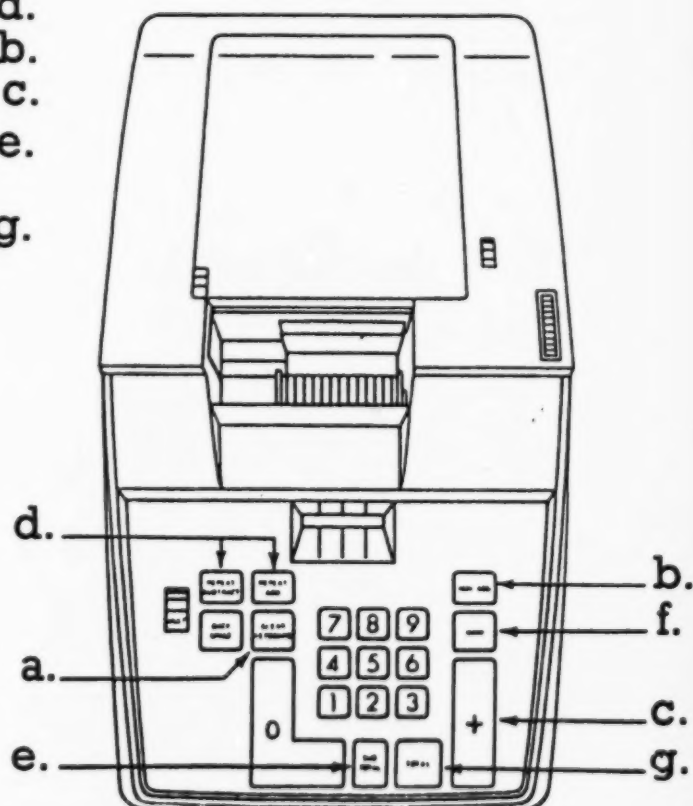
6. \$16.90
6.49
5.38
 28.77
1.73
 30.50

WORKSHEET

ADDING MACHINE PART IDENTIFICATION



- a. Correction (clear) key or lever
- b. Non-add key
- c. Plus (motor) bar
- d. Repeat key or lever
- e. Subtotal key
- f. Subtraction (minus) key, bar, or lever
- g. Total key



SOURCE: Agribusiness Sales and Marketing, p.585

WORKSHEET

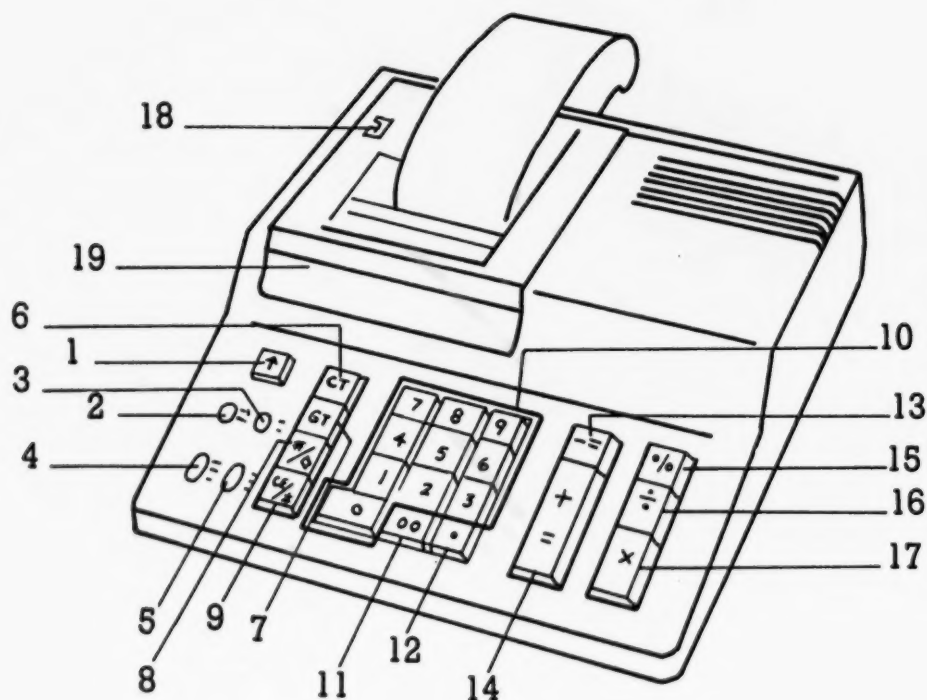
What are the functions of the main parts of an adding machine?

- a) Clear key - (correction) identified by a "C", clears an incorrect entry on the keyboard
- b) Non-add key - identified by "N" or # symbol, used to identify an amount on the tape but the amount doesn't become part of the calculation.
- c) Plus (motor) bar - identified by plus (+) symbol, it is used to index numbers to be added
- d) Repeat key - identified by an "X" symbol, used to set up machine to perform multiplication calculations
- e) Subtotal key - identified by "S", used to print a partial total; will print the accumulated amount while not clearing the total from the machine
- f) Subtract key - identified by a minus (-) symbol, used to index numbers to be subtracted.
- g) Total key - identified by a "T", prints the accumulated total and also clears the total calculation from the accumulator.

SOURCE: Agribusiness Sales and Marketing, p. 528.

WORKSHEET

ELECTRONIC CALCULATOR PART IDENTIFICATION



- | | |
|------------------------------------|-------------------------|
| 1. Paper feed key | 10. Numeral keys |
| 2. Print mode selector | 11. Double zero key |
| 3. Grand total selector | 12. Decimal point key |
| 4. Constant/Add mode selector | 13. Minus equals key |
| 5. Decimal selector | 14. Plus equals key |
| 6. Count key | 15. Percent key |
| 7. Grand total key | 16. Division key |
| 8. Non-add/Sub-total key | 17. Multiplication key |
| 9. Clear entry/clear and total key | 18. Paper release lever |
| | 19. Display |

SOURCE: Agribusiness Sales and Marketing, p. 547.

WORKSHEET

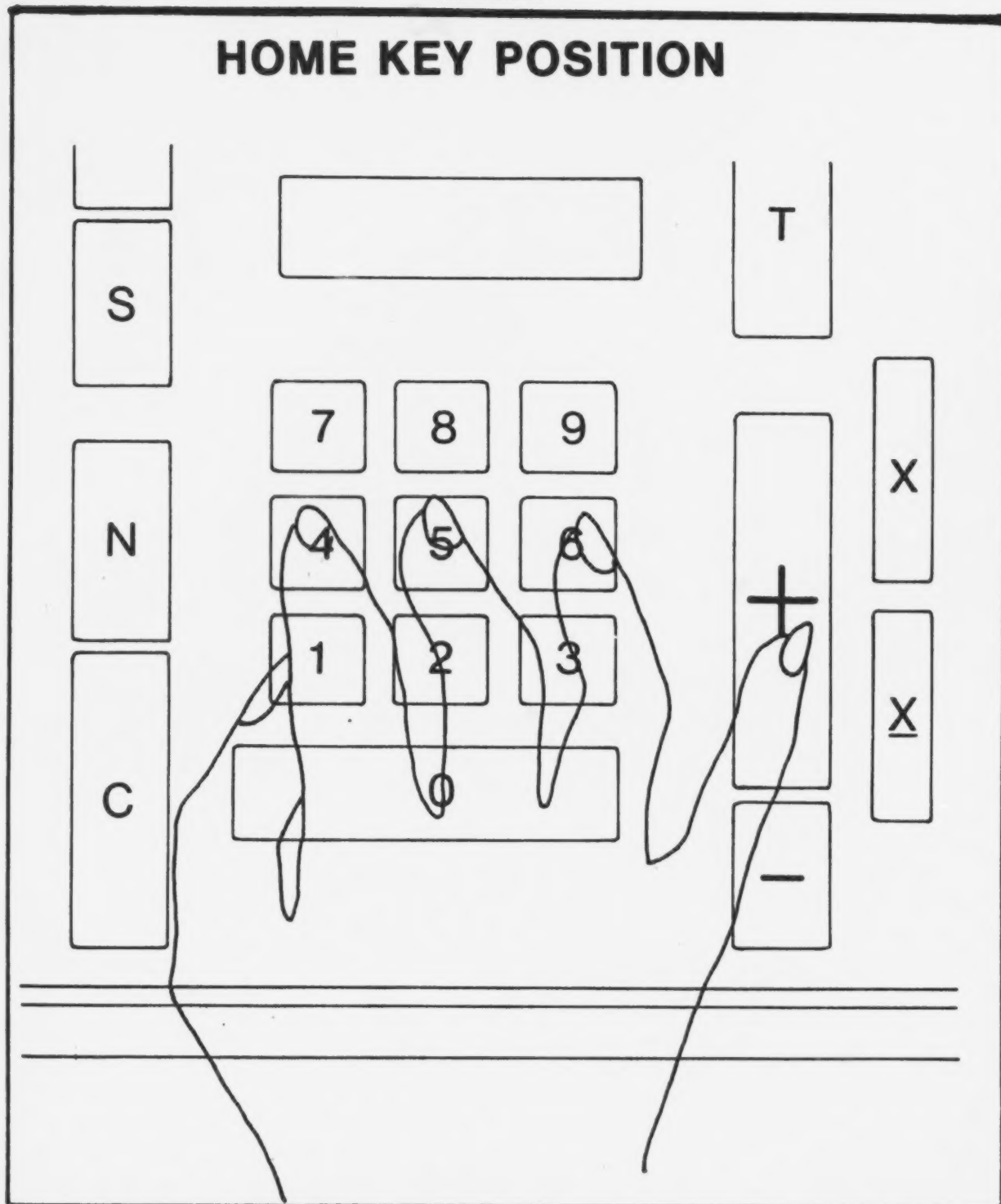
The functions of the main parts of an electronic calculator:

- 1) On/Off switch
- 2) [.] key - enters a decimal point; only the first decimal entry is observed or recorded
- 3) [+] key - instructs calculator to add (Note: If you push the bottom repeatedly, it will keep adding the last number entered)
- 4) [-] key - instructs calculator to subtract; repeated depression continues to subtract the last number entered from the result
- 5) [X] key - instructs calculator to multiply the previous number or result by the following number
- 6) [÷] key - instructs calculator to divide the previous number or result by the following number
- 7) [=] key - instructs calculator to complete the previously entered operations to provide the desired calculation result
- 8) [C] key - clears (erases) information in calculator and display and sets calculator to zero for start of new problem
- 9) [CE] key - clears the calculator and display of the last keyboard entry unless a function key ([+], [-], [X], [÷], [%]) has been pressed
- 10) [%] key - used to find percentages of numbers
 - a) When used with the [X] or [+] keys, the [%] key computes add-on percentages, such as taxes and totals
 - b) With the [-] key, the [%] key computes discounts and totals.
 - c) When the [%] key is used in division, results are expressed as percentage. For example, the key sequence 125 [÷] 500 [%] gives 25% as the answer. The display will indicate 25.00 as the answer.
- 11) [M+] key - adds displayed number to memory
- 12) [M-] key - subtracts displayed number from memory
- 13) [MR] key - recalls number in memory to display

- 14) [MC] key - clears only the memory
- a) Memory functions - add to, subtract from, or clear the memory with out affecting the displayed number or calculation in progress
- 15) Display
- a) Power ON indication - the presence of digits in the display is indication that power is ON
 - b) Minus sign - Appears at the left of the displayed number to indicate negative numbers
 - c) Decimal points - automatically appears to the right of any number entered unless positioned in another sequence by use of [.] key. A zero will precede the decimal for decimal numbers
 - d) Calculation overflow indication - when a calculated result is more than eight digits, the sign E will appear on the display and the calculator will not accept any key instructions except the [C] or [CE] key
 - e) Decimal alignment - in addition or subtraction problems, the calculator will display a result with as many decimal places as are contained in the entry with the most decimal places
 - f) Automatic constant - addition, subtraction, multiplication or division with a constant number is automatic
 - 1) The first number entered in multiplication will be constant. The second number entered in the other three functions will be constant.
 - g) Change sign - the [CS] key changes the sign of the sign of the displayed number
 - h) Decimal point location - automatically appears to the right of any number entered unless the [.] key is used
 - 1) The calculator automatically positions the decimal to display the most significant digits of the result.

WORKSHEET

HOME KEY POSITION



SOURCE: Agribusiness Sales and Marketing, p. 549.

WORKSHEET

Proper techniques in using adding machines and electronic calculators.

1) Beginning Procedures

- a) Read and understand each job before you begin.
- b) Sit erect and relax with the machine slightly to the right. (If you are left handed, move the machine to the left.)
- c) Place both feet flat on the floor.
- d) Clear the machine of previous calculations by depressing the total key. The symbol T, *, or 0 will appear when the machine is clear.

2) Proper use of fingers (Use AB #20 to illustrate hand positions.)

- a) Position the first, second, and third fingers on the middle bank of keys (the 4, 5, and 6 respectively).
- b) Move your fingers up to the top bank of keys for the 7, 8, and 9.
- c) Bring your fingers back to the middle bank.
- d) Reach down to the lower bank of keys for the 1,2,and 3.
- e) Practice reaching with your index finger up to 7 and down to 1 from the home key of 4. (Note: Your fingers should be curved slightly and you should guide your first finger to the center of the keys for 7, 4, and 1.)
- f) Practice reaching up to 8 from the home key, 5, and down to 2 with your second finger (the middle finger).
- g) Practice using the third finger (the ring finger) to reach from the home key, 6, up to 9 and down to 3.
- h) Practice until you can reach for the keys 1 through 9 without looking at your fingers.
- i) Practice depressing the zero bar or keys, using the thumb.
- j) Strike the keys firmly in the center and release them quickly. (Note: You can strike only one key at a time, therefore, be sure to release quickly so that the next key can be depressed. If you happen to depress the wrong key and discover your error before punching the plus (+) bar or other function keys, use the error key on the adding machine or the [CE] key on the calculator to eliminate that number from the calculation.)

SOURCE: Agribusiness Sales and Marketing, pp. 329-30.

WORKSHEET

Procedures for performing mathematical operations:

1) Mathematical operations with the adding machine

a) Adding

- (1) Clear the machine. The clear symbol should be printed on the tape.
- (2) Keep your eyes on the problem instead of the keyboard.
- (3) Enter the first number by pressing the appropriate key(s).
- (4) Press the plus (+) bar.
- (5) Enter the next number by pressing the appropriate key(s).
- (6) Press the total key if only adding two numbers or press the (+) bar and enter the next number.
- (7) Sample Problems

$$\begin{array}{r} 123.00 \\ +406.00 \\ \hline 529.00 \end{array}$$

$$\begin{array}{r} 32.11 \\ 66.22 \\ +95.33 \\ \hline 193.66 \end{array}$$

$$\begin{array}{r} 6,789.00 \\ 3,762.13 \\ 37.44 \\ + 563.07 \\ \hline 11,151.64 \end{array}$$

b) Subtracting

- (1) Clear the machine. The clear symbol should be printed on the tape.
- (2) Keep your eyes on the problem, not on the keyboard.
- (3) Enter the number to be subtracted from.
- (4) Press the plus (+) bar.
- (5) Enter the next number to be subtracted.
- (6) Press the subtraction or minus key (-). (Note: On some machines you may have to press the plus (+) bar after pressing the (-) key.)
- (7) Press the total key.

$$\begin{array}{r} 36.86 \\ -17.32 \\ \hline 19.54 \end{array}$$

$$\begin{array}{r} 6,893.98 \\ - 468.66 \\ \hline 6,425.32 \end{array}$$

$$\begin{array}{r} 86,357.73 \\ - 9,432.51 \\ \hline 76,925.22 \end{array}$$

c) Use of subtotal key

- (1) Clear machine
- (2) Enter in and print the numbers required for the problem.
- (3) Press the subtotal key for a subtotal.

AB #22
cont.

- (4) Enter in and print the remaining numbers.
(5) Press the total bar, when machine is done printing it is cleared.
(6) Sample problems:

4.09	14.14	21.03
16.35	6.09	163.15
11.66	5.31	14.59
<u>2.01</u>	116.27	<u>6.05</u>
34.11 S	8.54	204.82 S
14.27	<u>11.94</u>	.56
5.30	162.29 S	40.53
27.74	15.48	<u>106.33</u>
174.63	<u>8.61</u>	352.24 T
<u>4.15</u>	186.38 T	
260.20 T		

WORKSHEET

Mathematical operations for the electronic calculator

a) Adding

- (1) Clear the machine; look for the clear symbol on the tape or display.
- (2) Enter in your first number by pressing the appropriate numbered keys.
- (3) Print the amount by pressing the plus or add key.
- (4) Enter in the second amount.
- (5) Press the plus or add key.
- (6) Enter the remaining numbers in the problems using the same procedures.
- (7) Press the total key for a total.
- (8) Sample Problems

$$\begin{array}{r} 456.00 \\ + 221.00 \\ \hline 677.00 \end{array}$$

$$\begin{array}{r} 132.18 \\ + 72.96 \\ \hline 205.14 \end{array}$$

$$\begin{array}{r} 1,056.82 \\ + 7,820.50 \\ \hline 8,877.32 \end{array}$$

b) Subtraction

- (1) Clear the machine.
- (2) Enter in amount or number to be subtracted from.
- (3) Print the first number by pressing the plus key.
- (4) Enter in the amount to be subtracted.
- (5) Print the amount by pressing the minus [-] key.
- (6) Press the total key for a total.
- (7) Sample problems:

$$\begin{array}{r} 356.00 \\ - 85.00 \\ \hline 271.00 \end{array}$$

$$\begin{array}{r} 257.88 \\ - 199.62 \\ \hline 58.26 \end{array}$$

$$\begin{array}{r} 6,386.24 \\ - 2,597.89 \\ \hline 3,788.35 \end{array}$$

c) Correcting errors with subtraction and addition.

- (1) Before numbers are printed corrections can be made with correction key.
- (2) After numbers are printed on the tape:
 - (a) If the wrong amount was added, enter in that same amount and subtract.
 - (b) If the wrong amount was subtracted, re-enter the same amount and add.
 - (c) Example:

$$\begin{array}{r} 459.60 \\ + 589.20 \\ \hline 1048.80 \\ - 459.60 \\ \hline 589.20 \end{array}$$

$$\begin{array}{r} 256.30 \\ - 182.15 \\ \hline 74.15 \\ + 182.15 \\ \hline 256.30 \end{array}$$

d) Multiplication

- (1) Clear the machine
- (2) Enter the number to be multiplied (multiplicand).
- (3) Press the [X] key.
- (4) Enter the multiplier.
- (5) Press the [=] key.
- (6) Record the answer.
- (7) Sample problems:

$$\begin{array}{r} 182.30 \\ \times \quad 5 \\ \hline 911.50 \end{array}$$

$$\begin{array}{r} 256.89 \\ \times \quad 11 \\ \hline 2,825.79 \end{array}$$

$$\begin{array}{r} 10.29 \\ \times \quad 50 \\ \hline 514.50 \end{array}$$

e) Division

- (1) Clear the machine
- (2) Enter the number to be divided (dividend).
- (3) Press the [:] key.
- (4) Enter the number to divide by (divisor).
- (5) Press the [=] key to obtain the answer.
- (6) Record the answer.
- (7) Sample problems:

$$568 \div 30 = 18.93 \quad 256.23 \div 4 = 64.06 \quad 2568 \div 40 = 64.20$$

f) Using the electronic calculator to find percentages.

- (1) For example to find 6% of \$1,250
 - (a) Enter the amount 1250.
 - (b) Press the [X] key.
 - (c) Enter the number .06 (6% in decimal form).
 - (d) Press the [=] key for the answer of 75.
 - (e) Record your answer.
- (2) Using the [%] key
 - (a) Adding 5% sales tax to a \$65 purchase
 1. Enter the amount of 65.
 2. Press the [X] key.
 3. Enter the amount of the sales tax, 5.
 4. Press the [%] key.
 5. A subtotal of 3.25 will display.
 6. Press the [+] key for a total of 68.25.
 - (b) Taking a 10% discount on \$125 plus a 4% sales tax.
 1. Enter the amount 125.
 2. Press the [X] key.
 3. Enter the discount of 10.
 4. Press the [%] key.
 5. A subtotal of 12.50 will display.
 6. Press the [-] key for the total of 112.50.
 7. Press the [X] key to re-enter 112.50.
 8. Enter the amount of the sales tax 4.
 9. Press the [%] key.
 10. A subtotal will display. Press the [+] key for the total of \$117.

WORKSHEET

PROBLEMS TO WORK WITH AN ADDING MACHINE

Using the proper procedures to calculate the following sets of problems.
Remember to keep your eyes on the problems and not on the keyboard.

1. Addition Problems

Home row - 4, 5, 6

(1)	546	(2)	546	(3)	465	(4)	564	(5)	465
	465		654		456		645		645
	654		465		645		456		564
	565		456		546		465		456
	<u>+645</u>		<u>+564</u>		<u>+654</u>		<u>+654</u>		<u>+546</u>

Top row - 7, 8, 9

(6)	747	(7)	747	(8)	696	(9)	789	(10)	679
	585		858		969		465		869
	696		969		858		968		479
	475		458		747		489		659
	<u>+698</u>		<u>+468</u>		<u>+968</u>		<u>+568</u>		<u>+469</u>

Bottom Row - 1, 2, 3, and 0

(11)	414	(12)	426	(13)	105	(14)	741	(15)	520
	525		231		360		852		408
	636		321		410		963		899
	103		532		632		592		540
	<u>+203</u>		<u>+612</u>		<u>+231</u>		<u>+704</u>		<u>+321</u>

All Rows

(16)	13	(17)	76	(18)	98	(19)	987	(20)	112
	35		67		87		765		221
	56		78		76		345		433
	67		79		45		322		344
	<u>+87</u>		<u>+ 89</u>		<u>+12</u>		<u>+101</u>		<u>+655</u>

(21)	684	(22)	898	(23)	515	(24)	755	(25)	686
	747		343		936		648		874
	488		434		750		693		912
	953		767		295		420		760
	<u>+462</u>		<u>+345</u>		<u>+735</u>		<u>+682</u>		<u>+747</u>

(26)	339	(27)	208	(28)	690	(29)	856	(30)	787
	556		513		371		345		765
	155		796		145		165		888
	168		532		288		990		561
	<u>+890</u>		<u>+185</u>		<u>+593</u>		<u>+289</u>		<u>+776</u>

2. Subtraction and credit balance problems (Negative balance)

Subtraction:

(1)	54.76	(2)	65	(3)	12,226	(4)	365	(5)	745
	<u>-10.26</u>		<u>-31</u>		<u>-10,845</u>		<u>-188</u>		<u>-475</u>

(6)	377	(7)	845	(8)	616	(9)	752	(10)	395
	518		145		-40		638		-78
	-695		-254		456		-682		34
	-125		754		880		761		-11
	<u>170</u>		<u>-435</u>		<u>-480</u>		<u>-612</u>		<u>29</u>
					789				
					<u>-160</u>				

Credit Balance:

(1)	543	(2)	174	(3)	670	(4)	746	(5)	830
	<u>-769</u>		<u>-768</u>		<u>-987</u>		<u>-999</u>		<u>-1,780</u>

(6)	362	(7)	180	(8)	171	(9)	941	(10)	410
	32		-854		118		384		372
	986		671		-538		-532		224
	-642		146		284		24		-981
	28		-362		-873		81		34
	-843		176		334		<u>-972</u>		-621
	36		<u>-564</u>		<u>-268</u>				<u>74</u>
	<u>-386</u>								

(11)	882	(12)	497	(13)	658	(14)	489	(15)	-619
	211		327		-931		525		550
	-756		42		-582		-697		-901
	360		-657		124		-740		47
	-984		-811		14		31		-876
	56		92		95		-98		449
	<u>64</u>		<u>-103</u>		<u>-360</u>		<u>118</u>		<u>316</u>

(16)	396	(17)	6734	(18)	3021	(19)	209	(20)	92
	-258		-2473		3021		403		87
	76		1365		-8362		-900		-43
	-844		-589		91		568		11
	<u>-962</u>		<u>-6106</u>		<u>740</u>		<u>-785</u>		<u>-539</u>

3. Subtotal Problems

Subtotals - (S) indicates subtotal

(1)	452	(2)	185	(3)	300	(4)	471	(5)	444
	110		369		275		855		134
	916		250		309		399		464
	639		622		772		287		625
	S		S		S		S		S
	400		298		595		261		190
	175		345		703		187		613
	298		185		398		883		787
	<u>225</u>		<u>952</u>		<u>125</u>		<u>925</u>		<u>935</u>
	T		T		T		T		T

(6)	167	(7)	733	(8)	451	(9)	119	(10)	561
	889		365		724		641		306
	101		896		675		497		823
	23		986		824		724		145
	S		S		S		S		S
	527		240		126		451		872
	240		109		691		420		154
	328		338		724		651		563
	<u>900</u>		<u>467</u>		<u>75</u>		<u>989</u>		<u>986</u>
	T		T		T		T		T

WORKSHEET

PROBLEMS TO WORK ON WITH AN ELECTRIC CALCULATOR

1. Addition Problems

Home row - 4, 5, 6

(1)	546	(2)	645	(3)	546	(4)	654	(5)	465
	565		546		645		564		546
	456		456		654		456		554
	645		645		465		645		466
	<u>564</u>		<u>564</u>		<u>664</u>		<u>546</u>		<u>654</u>

Top row - 7, 8, 9

(6)	789	(7)	585	(8)	696	(9)	789	(10)	679
	879		885		858		465		847
	978		696		747		945		569
	474		669		956		876		647
	<u>744</u>		<u>477</u>		<u>845</u>		<u>598</u>		<u>869</u>

Bottom Row - 1, 2, 3, and 0

(11)	414	(12)	221	(13)	103	(14)	592	(15)	520
	302		532		320		863		804
	103		612		410		230		321
	321		406		632		703		310
	<u>123</u>		<u>300</u>		<u>132</u>		<u>961</u>		<u>366</u>

2. Subtotal Problems

Subtotals - (S) indicates subtotal

(1)	542	(2)	581	(3)	200	(4)	714	(5)	444
	110		639		275		558		312
	691		250		930		399		565
	963		226		S		278		S
	S		S		772		S		625
	400		982		955		162		190
	751		453		307		871		S
	982		851		S		883		631
	<u>522</u>		<u>592</u>		398		<u>259</u>		787
	T		T		<u>123</u>		T		<u>539</u>
					T				T

3. Subtraction and credit balance problems

Subtraction:

(1)	47.56	(2)	87	(3)	12,468	(4)	653	(5)	754
	<u>-26.10</u>		<u>-36</u>		<u>-10,312</u>		<u>-276</u>		<u>-470</u>

(6)	773	(7)	485	(8)	798
	815		415		-106
	-695		-524		880
	170		574		-460
	<u>-186</u>		<u>-354</u>		546
					50
					<u>616</u>

Credit Balance:

(1)	463	(2)	364	(3)	726	(4)	321	(5)	830
	<u>-697</u>		<u>-768</u>		<u>-954</u>		<u>-654</u>		<u>-1,936</u>

(6)	896	(7)	328	(8)	132
	632		-548		108
	84		176		-835
	-698		461		284
	82		-623		348
	-896		167		-682
	63		-465		<u>65</u>
	<u>-986</u>		<u>33</u>		

5. Multiplication Problems

(1)	134	(2)	721	(3)	637	(4)	845	(5)	809
	<u>x 32</u>		<u>x 8</u>		<u>x 411</u>		<u>x 43</u>		<u>x 120</u>

$$\begin{array}{r} (6) \quad 63.2 \\ \times 2.5 \\ \hline \end{array}$$

$$\begin{array}{r} (7) \quad 43.66 \\ \times 2.53 \\ \hline \end{array}$$

$$\begin{array}{r} (8) \quad 16.306 \\ \times 4.8 \\ \hline \end{array}$$

$$\begin{array}{r} (9) \quad 3.64 \\ \times .29 \\ \hline \end{array}$$

$$\begin{array}{r} (5) \quad 18.52 \\ \times 6.3 \\ \hline \end{array}$$

$$\begin{array}{r} (11) \quad 44.8 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} (12) \quad .76 \\ \times 93 \\ \hline \end{array}$$

$$\begin{array}{r} (13) \quad 106 \\ \times .08 \\ \hline \end{array}$$

$$\begin{array}{r} (14) \quad 321.08 \\ \times 8.06 \\ \hline \end{array}$$

$$\begin{array}{r} (15) \quad 1,483 \\ \times 681 \\ \hline \end{array}$$

6. Division Problems

$$(1) \quad 144 \div 12 =$$

$$(2) \quad 625 \div 5 =$$

$$(3) \quad 1,728 \div 144 =$$

$$(4) \quad 1,725 \div 25 =$$

$$(5) \quad 3,136 \div 14 =$$

$$(6) \quad 1,344 \div 28 =$$

$$(7) \quad 486 \div 46 =$$

$$(8) \quad 7,643 \div 53 =$$

$$(9) \quad 360 \div .18 =$$

$$(10) \quad 50.16 \div 4 =$$

7. Percentage Problems

	Amount of Discount	Net Amount
(1) 863.72 less 2%	_____	_____
(2) 761.29 less 11%	_____	_____
(3) 936.42 less 9%	_____	_____
(4) 1,627.99 less 67%	_____	_____
(5) 27.16 less 3%	_____	_____
(6) 914.44 less 5%	_____	_____
(7) 47.47 less 15%	_____	_____
(8) 379.99 less 50%	_____	_____
(9) 462.86 less 12%	_____	_____

A. Cost of Article	Percent of Markup	Markup Price
(1) 26.13	13%	_____
(2) 162.36	92%	_____
(3) 117.77	14%	_____
(4) 93.66	16%	_____
(5) 262.77	105%	_____

B. Selling Price	Percent of Markdown	
(1) 69.69	25%	_____
(2) 199.95	33%	_____
(3) 206.66	10%	_____
(4) 576.42	50%	_____
(5) 33.12	20%	_____

C. John Elk Tractor Sales Report
Weekly Sales Commission

Individual	Total Sales	Commission	Commission Earned
Jackson	6,246.82	5%	_____
Antone	543.61	10%	_____
Wilson	1,216.66	8%	_____
Smith	4,512.44	16%	_____
Hemphill	12,621.99	21%	_____
Eaton	2,666.84	9%	_____
Frisco	997.12	3%	_____
Hernandez	6,682.82	14%	_____
El Fonce	4,621.32	21%	_____
Brownly	876.22	25%	_____

8. Using Constants

Payroll

Johnson 36 hrs. @ \$3.50 hr.	_____
Franks 33 hrs. @ 3.50 hr.	_____
Haltom 27 hrs. @ 3.50 hr.	_____
Carrly 40 hrs. @ 3.50 hr.	_____
Hughes 39 hrs. @ 3.50 hr.	_____
TOTAL	_____

Sales Slip

6 Ear tags @ \$1.26 Ear tag	_____
3 Ear tags @ 1.26 Ear tag	_____
126 Ear tags @ 1.26 Ear tag	_____
412 Ear tags @ 1.26 Ear tag	_____
139 Ear tags @ 1.26 Ear tag	_____
TOTAL	_____

Air Filter

126 Filters @ \$12.86 Filter	_____
462 Filters @ 12.86 Filter	_____
1167 Filters @ 12.86 Filter	_____
1011 Filters @ 12.86 Filter	_____
4044 Filters @ 12.86 Filter	_____
TOTAL	_____

GRAND TOTAL _____

ANSWERS TO AB #24a

1. Addition Problems

1. 2,875	2. 2,685	3. 2,766	4. 2,784	5. 2,676
6. 3,201	7. 3,500	8. 4,238	9. 3,279	10. 3,155
11. 1,881	12. 2,122	13. 1,738	14. 3,852	15. 2,688
16. 258	17. 389	18. 318	19. 2,520	20. 1,765
21. 3,334	22. 2,787	23. 3,231	24. 3,198	25. 3,979
26. 2,108	27. 2,234	28. 2,087	29. 2,645	30. 3,777

2. Subtraction and Credit Balance Problems

Subtraction

1. 44.50	2. 34	3. 1,381	4. 177	5. 270
6. 245	7. 1,055	8. 2,061	9. 857	10. 369

Credit Balance

1. 226 CR	2. 594 CR	3. 317 CR	4. 253 CR	5. 950 CR
6. 427 CR	7. 607 CR	8. 772 CR	9. 74 CR	10. 488 CR
11. 167 CR	12. 613 CR	13. 982 CR	14. 372 CR	15. 1034 CR
16. 1592 CR	17. 1069 CR	18. 1489 CR	19. 505 CR	20. 392 CR

3. Subtotal Problems

1. 2,117S 3,215T	2. 1,426S 3,206T	3. 1,656S 3,477T	4. 2,012S 4,268T	5. 1,667S 4,192T
6. 1,180S 3,175T	7. 2,980S 4,134T	8. 2,674S 4,290T	9. 1,981S 4,492T	10. 1,835S 4,410T

ANSWERS TO AB #24b

1. Addition Answers

Home Row:

1. 2776
2. 2856
3. 2974
4. 2865
5. 2685

Top Row:

1. 3864
2. 3312
3. 4102
4. 3673
5. 3611

Bottom Row:

1. 1263
2. 2071
3. 1597
4. 3349
5. 2321

2. Subtotal Answers

1. 2306 S	4961 T	
2. 1696 S	4574 T	
3. 1405 S	3439 S	3960 T
4. 1949 S	4124 T	
5. 1321 S	2136 S	4093 T

ANSWERS TO AB #24b - cont.

3. Subtraction and Credit Balance Problems

Subtraction

1. 21.46
2. 51
3. 2156
4. 377
5. 284
6. 877
7. 596
8. 2324

Credit Balance

1. 234 CR
2. 404 CR
3. 228 CR
4. 333 CR
5. 1106 CR
6. 823 CR
7. 471 CR
8. 580 CR

4. Multiplication Answers

- | | | |
|------------|-------------|---------------|
| 1. 4288 | 6. 158 | 11. 268.8 |
| 2. 5768 | 7. 110.4598 | 12. 70.68 |
| 3. 261,807 | 8. 78.2688 | 13. 8.48 |
| 4. 36,335 | 9. 1.0556 | 14. 2587.90 |
| 5. 97,080 | 10. 116.676 | 15. 1,009,923 |

5. Division Answers

- | | |
|--------|-----------|
| 1. 12 | 6. 48 |
| 2. 125 | 7. 10.57 |
| 3. 12 | 8. 144.21 |
| 4. 69 | 9. 2000 |
| 5. 224 | 10. 12.54 |

6. Percentage Problems Answers

Amount of Discount

Net Amount

- | | |
|---------|--------|
| 17.27 | 846.45 |
| 83.74 | 677.55 |
| 84.28 | 852.14 |
| 1090.75 | 537.24 |
| 0.81 | 26.35 |
| 45.72 | 868.72 |
| 7.12 | 40.35 |
| 189.99 | 189.99 |
| 55.54 | 407.32 |

- | | | | |
|-------------|-------------|--------------|------------|
| A. 1. 29.53 | B. 1. 52.27 | C. 1. 312.34 | 6. 240.02 |
| 2. 311.73 | 2. 133.97 | 2. 54.36 | 7. 29.91 |
| 3. 134.26 | 3. 185.99 | 3. 97.33 | 8. 935.59 |
| 4. 108.65 | 4. 288.21 | 4. 721.99 | 9. 970.48 |
| 5. 538.68 | 5. 26.50 | 5. 2,650.62 | 10. 219.06 |

ANSWERS TO AB #24b - cont.

7. Answers to Constant Problems

Payroll	126.00
	115.50
	94.50
	140.00
	136.50
	612.50 Total

Sales Slip

Ear Tags	7.56
	3.78
	158.76
	519.12
	175.14
	864.36 Total

Air Filters	1,620.36
	5,941.32
	15,007.62
	13,001.46
	52,005.84
	87,576.60 Total

89,053.46 Grand Total

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AGRIBUSINESS

Temperament - indicates an ability to adapt to:

influence people in their opinions, attitudes, or judgments about ideas or things
make generalizations, evaluations, or decisions based on sensory or judgmental criteria
deal with people beyond giving and receiving instructions

1. Student will practice communication skills necessary for working in the agribusiness field. See "Demonstrating the Ability to Communicate Effectively with Employers, Co-workers and the Public" module located at the end of this manual.
2. Student will practice selling an agribusiness product using appropriate selling procedures. See Worksheet AB #25.
3. Student will work as a member of a team which will attempt to sell an agribusiness item to another team of students or the class. Have class or teacher evaluate the presentation.
4. Student will demonstrate knowledge of effective listening skills. See Worksheet AB #26.
5. Student will demonstrate appropriate telephone skills in the agribusiness field. See Worksheet AB # 27 for activities.
6. Student will identify the basic components of an agribusiness letter. See Worksheet AB # 28.
7. Student will write a letter to an agribusiness customer, bringing their attention to a new item for sale and stating why the customer should be interested in the item.

SUGGESTIONS FOR PARENTS:

1. Take student shopping for items in a hardware store. Have student compare items and state why a specific selection is made over another similar item. Try to list at least 3 reasons for the selection.
2. Have student lead a discussion with parents and/or family around the dinner table. Everyone in the discussion should participate at least twice.

WORKSHEET

PUTTING ACROSS IDEAS

One of the qualities of the successful employee is creativity. This involves the formulation of ideas and then putting them into practice. The latter is frequently the harder task. Many persons have ideas - some good and others of lesser value. But they run into difficulty when it comes to translating them into activity.

There are many reasons why the employee fails to sell his idea. It may have been presented to the wrong person. Being new and possibly calling for radical change may have brought the rejection. It may have been a worthwhile suggestion but poorly presented. Therefore, the idea may have failed to receive due consideration. The idea may have been poorly perfected. It may contain minor flaws which attracted the attention of those to whom it was presented. The basic thought may need some revisions so that it is much more logical.

The fact that an idea was rejected does not imply necessarily that it was either good or bad. It should be recognized that some persons will oppose anything other than the ordinary or common practice. Should the individual have a new plan, method, or policy turned down, it would be well for him to examine the concept and the procedures used in setting forth the idea. Either or both may need some revision so that the presentation is more acceptable to others.

There are several guidelines which may prove useful to the person attempting to sell a new idea.

Present the Idea in Simple Terms

The listener feels at home with familiar words. He may feel ill at ease in the presence of unfamiliar ones. By keeping the language simple, one is in a much better position to present material clearly to others. A large vocabulary of high-powered words may impress others of one's knowledge of words, but it will seldom facilitate comprehension. There is a great likelihood that it will put the audience ill at ease and thereby elicit adverse reactions to the proposal being set forth.

Will Rogers is reported to have said, "I love words but I don't like strange ones. You don't understand them, and they don't understand you. Old words are like old friends - you know 'em the minute you see 'em." This noted humorist expressed the views of many persons.

The speaker should be aware that the words he uses may impart an entirely different meaning to the hearer than the one intended. The English language is in a continuous state of change. Expressions have a variety of connotations. People with different backgrounds and experience may place a variety of interpretations on what was said. Simple, short well-chosen words will tend to reduce the chances of being misinterpreted.

Plan the Idea and the Approach Well

A haphazard presentation will doom many good ideas to the waste basket. To reduce the chances of this happening one should think through the project to its logical conclusion. Only then is it appropriate to attempt to sell the views to others. If the presentation is vague and piecemeal, it will seldom be very convincing.

One approach that has been used successfully is to reduce the idea to writing. Then it is much easier to discover gaps in the plan and inconsistencies of various sorts. First, present the overall plan in condensed form. This gives the audience a capsule version of what is being projected. Then follow-up this with an expanded version in which the details are given. In other words, present first a "skeleton" description of the project in which only the essentials are included. Then present the "entire animal" - skeleton, flesh, blood, horns, and hide.

This will give the audience a bird's eye view as well as a detailed projection of the proposal. It will have the effect also of convincing them that this is no overnight hairbrained idea.

Be Enthusiastic About the Idea and Show It in the Presentation

There is an old proverb which may have an implication here - "faint heart never wins fair lady."

The normal reaction of the audience is that if the proposer does not believe in what he is trying to sell why should they be sold on it. Enthusiasm is contagious. It adds life to the presentation and attracts the attention of others as it causes the listener to take notice and give more consideration to the proposal.

A forthright presentation commands respect, whereas a dull dry approach tends to lull the audience to sleep and to make them restless.

Patience and Persistence Pay Dividends

There is a tendency on the part of many persons to give up too soon. One rebuff or an early disappointment may cause them to throw up their hands in despair and to shelve the idea. This causes some individuals to give up when success may be just around the corner.

There may be numerous reasons why the proposal received an unfavorable reaction. If some of these were changed the reception may have been much more acceptable. A review of the situation may give the proper insight into a better approach to use. This could include many things such as a reorganization of the proposal, the use of visuals in the presentation, and a different method entirely outlining the material to the audience.

It could be, however, that the idea is faulty or not worthwhile. The proposer should give consideration to this. There should be no hesitation to dispose of a view that is not acceptable, although one should be reasonably certain that it does not have merit before disposing of it.

Seek an Appropriate Time to Present a New Idea

Timing can make lots of difference in whether an idea is given an adequate hearing. This, in turn, may affect the prospects of receiving acceptance of the proposal.

The frame of mind of the audience at the time the idea is set forth determines to a large extent their initial reaction to it. Should they be rushed to meet a deadline, tired physically or mentally, harassed by some problem, or otherwise mentally preoccupied, it is highly unlikely that the proposal will receive a fair hearing or that there will be enthusiastic acceptance of it.

Be Prepared for Objections

One should anticipate areas of the proposal which will elicit questions and negative responses from the audience. The pros and cons of the idea should be considered carefully. Every negative view that can be foreseen should be examined, and plans prepared for handling it should be brought up.

Prior preparations should favor the presenter so that in his discourse he will eliminate many objections by the approach made. It is possible that there will still be some objections which were not foreseen. These should be handled calmly with no argumentative attitude being expressed by the one projecting the plans. It is possible that an argument may be won, and the proposal lost as an end result.

Let the People Sell Themselves on the Idea

There is a strong temptation to force a point to a final conclusion when one is convinced about an idea. Most people have to convince themselves. This is often a relatively slow process as what seems clear to the speaker may not be so obvious to the hearer.

Questions and answers are a normal part of discussion and are to be expected. This helps the listener make up his mind. People do not usually accept new ideas immediately. This takes time. Pressuring individuals for an immediate approval may bring forth a negative attitude.

New ideas are essential to improving a business. Equally as important is the application of old ideas in new ways. A fresh approach is needed occasionally to the problems that are encountered in the conduct of daily operations. The creative energies of the employee should be channeled into finding more effective ways to serve the organization of which he is a part.

In presenting new ideas and in dealing with others, timing is most important. An eminent university administrator indicated that success depends partially upon the art of making a contribution at the right time. He stated that this trait of timing is not learned from textbooks but from the process of trial and error, observation, experience, and conscious effort.

The problem is one of avoiding the pitfall of saying the right thing at the wrong time or the wrong thing at the right time.

From Essential Aspects of Career Planning and Development. 2nd ed., by J.C. Atherton and Anthony Mumphrey. Danville, Illinois: The Interstate Printers & Publishers, Inc., 1977. Used by permission.

SOURCE: Agribusiness Sales and Marketing, p. 140.

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RESOURCES

AGRIBUSINESS

Instructional Materials Laboratory
908 Woodson Way
University of Missouri-Columbia
Columbia, MO 65211

Agriculture Business Sales and Marketing

Instructional Materials Laboratory
908 Woodson Way
University of Missouri-Columbia
Columbia, MO 65211

Communications

The Ohio State University
Ohio Agricultural Education Curriculum
Materials Service
Columbus, OH 43210-1090

Human Relations in Agricultural Businesses

The Interstate Printers & Publishers, Inc.
19 N. Jackson Street
P.O. Box 50
Danville, IL 61834-0050

Essential Aspects of Career Planning and Development, 2nd ed.

WORKSHEET

LISTENING AND ANSWERING

Workers seldom fail because of a lack of knowledge or ability. Rather they fail because of a lack of understanding of what is desired of them. Most usually this problem is a result of poor listening skills that impede the comprehension of verbal instruction. Effective listening requires concentrated, dynamic attention.

Comprehension of what superiors desire requires concentration. One should center upon the content being presented, avoiding distraction by personality or mannerisms of the speaker. The sole objective of listening is to gain insight into what is desired.

Self-discipline is the key element to developing good listening skills. Distractions must be ignored and the more competing distractions are the more intensely we must concentrate upon what is being said or asked of us. Gestures, facial expressions and voice inflections punctuate conversations or directives and as such we need to pay attention to these. The attitude of the instruction giver is also of great importance. The effective listener is also a good observer and pays heed to these non-verbal messages for complete understanding of what is involved.

The attitude of the listener is also readily evident to the speaker. The listener's interest, or lack of interest is noted by his or her words and actions. Additionally, it is very difficult to conceal a lack of attentiveness to directives. Obviously, it is in the employee's best interest to be genuinely interested in what his or her superiors are saying.

In the same token, answering questions effectively is a skill one can and should develop. It is not uncommon that employees fail to accurately answer a superior's question. This is usually because the employee did not effectively listen to the question and really didn't understand what was being asked. You can see that the first step to answering questions is to be a good listener so that you can truly understand what is being asked of you. Secondly, it is important to think before we speak. Do not formulate and answer "on the go". Think of what your response will be, how can the question best be answered. Make answers concise and to the point. If elaboration is desired, you will surely be asked to do so.

Adapted from Essential Aspects of Career Planning and Development, 2nd ed., by J.C. Atherton and Anthony Mumphrey. Danville, IL: The Interstate Printers & Publishers, Inc., 1977. Used by permission.

WORKSHEET

POINTS TO REMEMBER WHEN USING THE PHONE

Proper Identification:

Good morning or good afternoon
Name of company
Name of person receiving the call

Courtesy:

Pleasant greeting
Use customer name
"Thank you" and "you're welcome"
Listen attentively

Sincerity:

Express confidence
Not mechanical
Not indifferent
Not impatient
Really wanting to serve the caller

Voice:

Distinctness
Loudness
Speed
Naturalness
Pleasantness
Alertness
Expressiveness

WORKSHEET

TELEPHONE SITUATION PROBLEM #1

The situation: The A to Z Farm Supply Co. is offering a special sale on fertilizer for the winter delivery at a reduction of \$5.00 per ton. This has been advertised in the paper. The customer calls up to order some of this fertilizer to be delivered. The office clerk has to look up the price of the kind desired. The clerk also needs to find out when the customer would like to have it delivered and where to put it.

Grade the person who is receiving the call.

Person Making the Call

Person Receiving the Call

Customer: I noticed in the paper that you are having a fertilizer sale. I would like to place an order.

Clerk: Answer for A to Z (your name)

Clerk: Ask how much and what kind.

Customer: I would like to have 10 tons of 12-12-12. Can you give me the price on this?

Clerk: You will have to look this price up in the price book. (how to handle this delay) (count 60 seconds before talking again) Price is \$72.00 per ton less the winter discount.

Customer: This will be all right. When do you think you would deliver it?

Clerk: Suggest a time.

Customer: Okay. I will be home at that time.

Clerk: Find out where the bags should be put.

Customer: On the barn floor.

Clerk: Ask if 50 or 80 pound bags are needed.

Customer: 50 pound bags would be better.

Clerk: Thank the customer for the order.

Take a few minutes to make up the conversation for the office clerk.

Adapted from: Human Relations in Agricultural Businesses, 1976, Ohio Agricultural Education Curriculum Materials Service, The Ohio State University.

WORKSHEET

TELEPHONE SITUATION PROBLEM #2

The situation: The manager of the garden supply store has asked the office clerk (your name) to call GARDEN SUPPLIES, INC. and order the following materials. These material are needed by the end of the week for the weekend trade. The manager would like to know if there is any increase in prices since the last time she ordered. She usually gives her order to Mr. King at the supply house. If Mr. King is not there, leave a message.

Grade the person making the call.

Person Making the Call

Person Receiving the Call

Office Clerk (your name):

Supplier:

Clerk: Ask for the supply store and Mr. King. If Mr. King is in, talk to him. If not, leave a message.

Supplier: (Mr. King can either be in or out.)

Clerk: Want to order:
 5 - 100# bags grass seed
 20 - 50# bags lawn fertilizer
 10 - lawn sprinklers
 10 - 100# bales peat moss

Supplier: When would you like to have this delivered?

Clerk: Explain that it is needed for the weekend.

Supplier: Our trucks will not be coming that way until Monday.

Clerk: Explain that Mr. King generally makes arrangements for special deliveries.

Supplier: If you are completely out, we will get it to you.

Clerk: Ask if there are any price increases.

Supplier: Everything is the same price as the last time except the lawn sprinklers that are up 10%.

Clerk: Thank them for accepting the order and ask to have the list repeated so you are sure it is correct.

Supplier: (Repeat the list) Thank you for the order.

Take a few minutes to make up the conversation for the clerk.

Adapted from: Human Relations in Agricultural Businesses, 1976, Ohio Agricultural Education Curriculum Materials Service, The Ohio State University.

WORKSHEET

TELEPHONE SITUATION PROBLEM #3

Person Making the Call

Person Receiving the Call

A to Z Farm Supply Co.
Office clerk answers phone.

Student: Ask for Mr(s). Brown.

Mr(s). Brown speaking.

Student: Say you are interested in
the job - has it been filled
yet?

Mr(s). Brown: Have you had
any truck
driving
experience?

Student: Just the farm truck.

Mr(s). Brown: Do you have a
driver's
license and
what is your
age?

Student: 18 years old and have had
a license for 2 years.

Mr(s). Brown: Well, I would
be glad to talk
with you, when
could you come
down to the
mill?

Student: Suggest a time.

Mr(s). Brown: That will be
okay with me.
I will be
looking for
you.

Student: Thank you Mr(s). Brown for
the opportunity of the
appointment.

Take a few minutes to make up conversation for the student before starting
to talk on the phone.

Adapted from: Human Relations in Agricultural Businesses, 1976, Ohio
Agricultural Education Curriculum Materials Service, The
Ohio State University.

WORKSHEET

TELEPHONE SITUATION PROBLEM #4

The situation: You are working in the parts department of the HANDY FARM EQUIPMENT CO. A farmer calls in to see when a corn picker can be repaired. A chain broke while picking corn. It is a busy season and all the service people are busy.

Grade the person who is receiving the call.

Person Making the Call

Person Receiving the Call

Farmer: I was wondering how soon I could have one of your service people come out and fix my corn picker.

Parts Dept.: Answers phone (identification)

Farmer: Broken chain.

Parts Dept.: Find out what is wrong with the picker.

Farmer: (Rather irritated.) But I can't do a thing until I get this fixed and it may rain by tomorrow.

Parts Dept.: You will have to check with our service manager. (How to handle the waiting period) (Count 60 seconds before talking again.)

Farmer: I don't call that very good service, but if that is the best you can do I guess I can bring it in.

Parts Dept.: Ask if this is a chain that could be brought in and repaired.

Farmer: I can't give you the part number, but it is the main drive chain on model 580 picker.

Parts Dept.: Ask for the part number so you could be getting ready while the farmer is on the way in

Parts Dept.: State that this will help. Close the conversation courteously and give the impression of good service.

Take a few minutes to make up the conversation for the parts man before starting to talk on the phone.

Adapted from: Human Relations in Agricultural Businesses, 1976, Ohio Agricultural Education Curriculum Materials Service, The Ohio State University.

WORKSHEET

WRITTEN COMMUNICATIONS

Planning the Message

Although the purpose of the written communication is to transmit a message whose meaning is clear, the written communication may also reveal much about the writer's personality. Skillful writers, therefore, plan their communications so that they convey not only the ideas they want to express, but also the image they want to reveal to the reader. To accomplish this dual goal, writers follow a three-step plan.

1. Identify the purpose of the message.
2. List the ideas and facts that will accomplish the purpose.
3. Organize the information.

Identification of the Purpose

The first step in planning a successful letter or memo is to identify the reason for writing it. What is the purpose of the message. It usually can be written in a few words, or a fragment of a sentence, and serves as a very brief outline for the message.

In business, two forms are commonly used to transmit written communications: the formal letter and the memorandum. The formal letter is the written communication used to transact business or communicate with strangers or acquaintances. The memorandum (memo) is a standardized form of written communication which is used to communicate with people within a business. The memo, therefore, makes it easy to communicate with co-workers, supervisors, or employers.

Listing of the Ideas and Facts

Next, writers list all the information that is related to the purpose of the communication. They probably will list more information than they will use in the message. To do so is a good technique, for it gives writers the opportunity to examine the relative importance of the material and to choose those ideas and facts that will convey the correct message to the reader.

Organization of Information

After listing the facts and ideas that relate to the message, writers number them to indicate the order in which they will use them. They select and present those facts in the following sequence: 1) those facts that direct the interest of the reader to the purpose of the message; 2) those facts that reveal the purpose of the message clearly and concisely, including appropriate explanation of the action to be taken and an expression of feelings of goodwill and understanding.

Preparing a Rough Draft

Once the order of the information to be put into a letter or memo has been identified, it is time to write a rough draft. A rough draft is the preliminary version of the written communication. Beginning writers should expect to make rough drafts of even simple letters and memos. Even experienced writers often make several drafts before perfecting important communications. In the first draft, writers attempt to organize the material so that the reader will want to read on and on and so that the reader can easily understand it. Ideas should flow smoothly.

To prepare a draft in which ideas flow smoothly, writers first create an opening which will capture the reader's interest and identify the purpose of the letter. They then arrange and present their ideas so that they lead the reader to the request for action or the closing.

The Opening

The opening of the letter, especially the opening sentence, should excite the reader's interest and lead them into the letter itself. If it does not, they may lay the letter aside. A few of the methods that help writers catch a reader's interest are:

- . Stating a significant fact: "The \$10 check attached to this letter is yours."
- . Asking a question that cannot arouse a negative response: "If you could visit any place in the world, where would you go?"
- . Referring to an interesting current happening: "When the plumbers went on strike yesterday...."
- . Beginning the first sentence with "if": "If this number happens to be chosen in our special drawing...."

The opening sentence not only should be intriguing, but it also must be relevant to the subject and to the purpose of the communication. It should be specific, not vague or general. It must be of worth, not trite. Because the opening sentence must interest the reader, it is written from his or her point of view and never begins with "I" or "We."

The Arrangement of Ideas

The ideas in a written communication flow smoothly so that the reader is carried from one sentence to the next, from one paragraph to the next, easily and willingly. This is done by showing the relationship between ideas. Relationship may be established by stating or implying that:

- . Ideas are similar: Such words as "and," "like," "also," "besides," and "in addition to" commonly compare or relate similar ideas.

- . Ideas are opposite or contrary: "although," "in spite of," and "however" are some of the words that point out opposite ideas.
- . Ideas that have a cause-and-effect relationship: "because," "since," and "therefore" may identify ideas with a cause-and-effect relationship.

The writer may use examples to illustrate any of these relationships.

The lack of an expressed relationship between ideas can make a message sound curt, unfriendly, or indifferent.

While drafting the letter or memo, examine your ideas: identify and express their correct relationships so readers clearly understand and easily follow the writer through one idea to another until they reach the closing.

The Five C's

When the first draft of a letter or memo is completed, read it as if you have never seen it before. With this objective view, evaluate your letter - the reader will. Does the opening catch the reader's interest? Does each sentence and paragraph easily lead the reader to the next? Does the reader clearly understand the purpose of the letter? In short, does the letter reflect the Five C's? They win readers for the writer just as they win listeners for the speaker. Courtesy, correctness, clearness, conciseness, completeness: attention to these Five C's results in a written communication that reflects the image of a writer who is considerate and responsible, who is interested in the reader, and who has something to tell the reader. Here is how the Five C's can be used to evaluate the letter or note.

Courtesy

Courtesy is expressed by phrasing a letter or memo so that its subject matter is discussed from the reader's point of view. The facts should be expressed the way the writer would want to hear them if positions were reversed and he or she were the reader. In a courteous letter, the words "you" and "your" appear more often than "I" and "we," and always with more emphasis on them.

Correctness

The writer tries to meet two criteria for correctness: to tell the truth and to be grammatically and mechanically correct.

Knowing the facts, all the facts, is the writers's responsibility. Writers assemble those facts either before beginning to draft the communication or while drafting it. The writers select for use in the message those facts that explain and complete the purpose of the message.

Opinion is less acceptable in writing than it is in oral communication. However, if the writers want to express an opinion in their message, they should label it as such, with an "it is my belief that..." or an "it may be that..." or a simple "I think..."

Because the writer's words, sentences, and paragraphs guide the thinking of the reader, the grammar, spelling and punctuation must be correct. Grammatical and mechanical errors interrupt the reader's thoughts and break the smooth flow of ideas. Poor grammar may mislead the reader by putting the wrong interpretation on an idea or fact. Incorrect spelling and punctuation also speak in their own dangerous language; "The writer does not know."

A solid education in grammar is an excellent friend for business writers. So is a dictionary. These two are important tools; they help people in a business to express the exact message they want to convey in everything they write.

Clearness

Exactly what do I want to say? Write the answer to this question simply and precisely. Be sure each statement has only one meaning - the meaning you intend to convey. When the thought is clearly stated, it is easily understood. An easily understood message holds the reader's interest.

Conciseness

Conciseness aids clearness. Conciseness is being specific, brief, not wordy; it means saying exactly what needs to be said to satisfy the purpose of the message - and no more. It means eliminating unnecessary words and phrases.

Completeness

The writer should give readers all the information they need to know so that they understand the message. A complete message need not be wordy, but it must tell enough so that 1) the purpose of the writer is accomplished and 2) readers clearly understand the writer's message.

Write for the Reader

A person or an entire business organization can be judged by one written communication. Its impression is lasting and can be read over and over. The most important part of that impression is made by thoughts expressed in the message and by the way they are expressed.

People are interested in themselves. They are interested in other people and things to the extent that they relate to or affect them.

Because of this, writers, must identify with readers and express their own purpose, ideas, and facts in words and phrases that will reflect the reader's point of view and concerns.

Everyone starts to read a written communication, particularly, a business letter or memo, with three questions in mind:

- Why was this communication sent to me?
- What does it do for me?
- Do I need to do something?

The writer must answer these questions. There is no pre-set sequence in which they need to be answered, but they do need to be answered.

"Why was this sent to me?"

The answer to this question reveals the purpose of the letter or memo and relates it to the reader.

"What does it do for me?"

The answer to this question translates facts and ideas into an explanation that sustains and satisfies the reader's interest. A benefit promotes the well-being of the reader. The benefit to a reader may be a payment, an advantage, a kindness, a courtesy, an opportunity, or perhaps simply the transmittal of helpful or useful information. It usually is a combination of several factors.

"Do I need to do something?"

The writer's request or suggestion that the reader take action is usually near the end of the communication. Not all communications require action from the reader, but when such action is needed or encouraged, the communication should state what is to be done and how. In addition, this statement should be worded so that the reader is both willing and encouraged to act.

CREDITS: Communications, Marketing/Distributive Education Curriculum, 1978, Instructional Materials Laboratory, University of Missouri - Columbia.

A Sample Agribusiness Letter

ACME Seed and Fertilizer
1800 West 51st Street
Monroe, Alabama 62746
Phone 811-0234

Heading

April 12, 1985

Mr. Charles Pare
Garden Grow Seed Company
1948 Elm Street
Montgomery, Alabama 63811

Inside
Address

Dear Mr. Pare:

Salutation

Your company has been suggested as a possible source of garden seed. We are in the process of expanding our varieties of garden seed and are interested in your line of seed.

Body

Would you please have your salesperson call on us at your earliest convenience.

Sincerely,

Complimentary
Closing

Jane Jones

Jane Jones
Purchasing Agent

Signature

cp

AGRIBUSINESS

Vocational

Demonstrate knowledge of basic safety concepts

1. Please see module on safety in the Instructional Module section.

SUGGESTIONS FOR PARENTS:

1. Allow student to put together a first aid kit for the home.
2. Have student go through the home and find areas where accidents might occur.

AGRICULTURAL POWER I/AGRICULTURAL MACHINERY
AND SMALL ENGINE REPAIR

Sample Occupational Areas:
Engine Repairer, Production
Gas Engine Repairer
Power Saw Mechanics
Small Engine Mechanic

Introduction

This vocational class is sometimes called Agricultural Power I/Small Engine Repair or Agricultural Machinery. All classes deal with the small, gasoline powered engine, such as is found in lawnmowers, chain saws and other small power equipment. Sometimes this class is a prerequisite for other classes (Auto Mechanics, Diesel Mechanics, Agricultural Power II - tractors and heavy farm equipment). The small engine repair class gives students basic knowledge about engines, and it should be suggested that students who want to enter the mechanics area enroll in this kind of class.

Students entering the small engine repair class need good mechanical, spatial relations, and dexterity skills. They will be working with hand and power tools, disassembling and reassembling small engine parts, and referring to service manuals for instructions and parts numbers.

VIMS COMPETENCIES FOR AGRICULTURAL POWER I

The student has mastered the related competencies of Agricultural Science I and II.

A. Explaining Principles of Operation

1. Explain the operating principles of a two-cycle engine
2. Explain the operating principles of a four-cycle engine
3. Identify safety procedures to follow when servicing and repairing a single cylinder engine *

Other (specify):

F. Testing and Analyzing a Single Cylinder Engine System

1. Test and analyze a carburetion system
2. Test and analyze a compression system
3. Test and analyze an ignition system
4. Test and analyze a fuel injection system
5. Test and analyze an electrical system
6. Test and analyze a lubrication system
7. Test and analyze a governor system

Other (specify):

B. Using Measuring Tools

1. Demonstrate the use of a micrometer
2. Demonstrate the use of a dial caliper
3. Demonstrate the use of a telescoping gauge
4. Demonstrate the use of a dial indicator
5. Demonstrate the use of a torque wrench
6. Demonstrate the use of a reject gauge (GO-NO GO gauge)
7. Demonstrate the use of a feeler gauge

Other (specify):

G. Servicing a Single Cylinder Engine

1. Clean, adjust and/or repair a carburetor
2. Service and adjust an electrical system
3. Grind and adjust valves
4. Recondition or replace cylinders and pistons
5. Service and repair a lubrication system
6. Clean and service a cooling system
7. Clean and service an air intake and exhaust system
8. Service and repair a mechanical starting system
9. Prepare engine for winter storage

Other (specify):

C. Using Shop Tools and Equipment

1. Demonstrate the use of shop hand tools
2. Demonstrate the use of shop power tools
3. Demonstrate the use of cleaning equipment

Other (specify):

D. Selecting Engine Parts and Fasteners

1. Identify parts of an engine
2. Select, install or assemble parts
3. Select correct engine fasteners

Other (specify):

E. Using a Service Manual

1. Interpret and apply a service manual
2. Select oils, fuels and lubricants

Other (specify):

* All competencies involving safety require a Number 3 Rating - Mastered.

VIMS COMPETENCIES FOR AGRICULTURAL MACHINERY

A. Following Safety Procedures

1. Demonstrate safe machinery operation practices
2. Demonstrate safe procedures for servicing, repairing, calibrating and adjusting agricultural machinery

Other (specify)

B. Operating and Maintaining Power Units

1. Demonstrate the uses of machinery operator manuals
2. Size and select unit
3. Service and repair unit
4. Calibrate and adjust unit
5. Check and service charging and starting
6. Check and service comfort systems
7. Check and service hydraulic systems
8. List steps to prepare machinery for post season storage
9. List steps to follow after removing machinery from post season storage
10. Explain principles of hitching and ballasting

Other (specify)

C. Operating and Maintaining Primary Tillage Equipment

1. Demonstrate the uses of machinery operator manuals
2. Size and select equipment
3. Service and repair equipment
4. Calibrate and adjust equipment
5. List steps to prepare machinery for post season storage
6. List steps to follow after removing machinery from post season storage
7. Explain principles of hitching and ballasting

Other (specify)

D. Operating and Maintaining Secondary Tillage Equipment

1. Demonstrate the uses of machinery operator manuals
2. Size and select equipment
3. Service and repair equipment
4. Calibrate and adjust equipment
5. List steps to prepare machinery for post season storage
6. List steps to follow after removing machinery from post season storage
7. Explain principles of hitching and ballasting

Other (specify)

E. Operating and Maintaining Planting Equipment

1. Demonstrate the uses of machinery operator manuals
2. Size and select equipment
3. Service and repair equipment
4. Calibrate and adjust equipment
5. List steps to prepare machinery for post season storage
6. List steps to follow after removing machinery from post season storage
7. Explain principles of hitching and ballasting

Other (specify)

F. Operating and Maintaining Chemical Applicators

1. Demonstrate the uses of machinery operator manuals
2. Size and select applicator
3. Service and repair applicator
4. Calibrate and adjust applicator
5. List steps to prepare machinery for post season storage
6. List steps to follow after removing machinery from post season storage
7. Explain principles of hitching and ballasting

Other (specify)

G. Operating and Maintaining Harvesting Equipment

1. Demonstrate the uses of machinery operator manuals
2. Size and select equipment
3. Service and repair equipment
4. Calibrate and adjust equipment
5. List steps to prepare machinery for post season storage
6. List steps to follow after removing machinery from post season storage
7. Explain principles of hitching and ballasting

Other (specify)

H. Operating and Maintaining Materials and Handling Equipment

1. Demonstrate the uses of machinery operating manuals

2. Size and select equipment
 3. Service and repair equipment
 4. Calibrate and adjust equipment
 5. List steps to prepare machinery for post season storage
 6. List steps to follow after removing machinery from post season storage
 7. Explain principles of hitching and ballasting
- Other (specify)
-
-
-

AGRICULTURAL POWER I/AGRICULTURAL MACHINERY
AND SMALL ENGINE REPAIR
ACCESS SKILLS CHECKLIST

Student Name/ID _____ Sending School _____

Instructor _____ Date(s) Evaluated _____

Circle proper mastery code: 3 = MASTERY 2 = REQUIRES SUPERVISION
 1 = NOT MASTERED N or blank = NO EXPOSURE

<u>TASK DESCRIPTION</u>	<u>TASK ID #</u>	<u>MASTERY CODE</u>	<u>MASTERY DATE</u>	<u>RETRY CODE/DATE</u>
1. Count two-place numbers	470696A001	3 2 1 N	_____	_____
2. Add two-place numbers	470696A002	3 2 1 N	_____	_____
3. Subtract two-place numbers	470696A003	3 2 1 N	_____	_____
4. Perform standard units of measure- ment, i.e., cup, pint, quart, inch, foot, yard, ounce, pound	470696A004	3 2 1 N	_____	_____
5. Use basic measuring instruments, i.e., rulers, scales	470696A005	3 2 1 N	_____	_____
6. Multiply two-place numbers	470696A006	3 2 1 N	_____	_____
7. Divide two-place numbers	470696A007	3 2 1 N	_____	_____
8. Add common fractions	470696A008	3 2 1 N	_____	_____
9. Subtract common fractions	470696A009	3 2 1 N	_____	_____
10. Multiply common fractions	470696A010	3 2 1 N	_____	_____
11. Divide common fractions	470696A011	3 2 1 N	_____	_____
12. Add two-place decimals	470696A012	3 2 1 N	_____	_____
13. Subtract two-place decimals	470696A013	3 2 1 N	_____	_____
14. Multiply two-place decimals	470696A014	3 2 1 N	_____	_____
15. Divide two-place decimals	470696A015	3 2 1 N	_____	_____
16. Lift 50 lbs. maximum with frequent lifting and/or carrying of objects weighing up to 25 lbs. (Medium work)	470696B001	3 2 1 N	_____	_____
17. Extend the hands and arms in any direction (reaching)	470696B002	3 2 1 N	_____	_____
18. Seize, hold, grasp, turn or other- wise work with the hand or hands (handling)	470696B003	3 2 1 N	_____	_____
19. Pick, pinch, or otherwise work with the fingers (fingering)	470696B004	3 2 1 N	_____	_____
20. Perceive size, shape, temperature or texture of objects and materials by using fingertips (feeling)	470696B005	3 2 1 N	_____	_____
21. Ability to work inside	470696B006	3 2 1 N	_____	_____
22. Ability to work in extreme noise, constant or intermittent, causing marked distraction or possibly injury to hearing	470696B007	3 2 1 N	_____	_____
23. Ability to work in extreme vibra- tion, i.e., strain on body or extremities from repeated motion or shock	470696B008	3 2 1 N	_____	_____

AGRICULTURAL POWER I/AGRICULTURAL MACHINERY
SMALL ENGINE REPAIR
ACCESS SKILLS CHECKLIST

Student Name/ID _____ Sending School _____

Instructor _____ Date(s) Evaluated _____

Circle proper mastery code: 3 = MASTERY 2 = REQUIRES SUPERVISION
 1 = NOT MASTERED N or blank = NO EXPOSURE

<u>TASK DESCRIPTION</u>	<u>TASK ID #</u>	<u>MASTERY CODE</u>	<u>MASTERY DATE</u>	<u>RETRY CODE/DATE</u>
24. Think visually of geometric forms (S-spatial)	470696C001	3 2 1 N	_____	_____
25. Comprehend the two dimensional representation of three-dimensional objects (S-spatial)	470696C002	3 2 1 N	_____	_____
26. Recognize the relationship resulting from the movements of objects in space (S-spatial)	470696C003	3 2 1 N	_____	_____
27. Perceive pertinent detail in objects in pictorial or graphic material (P-form perception)	470696C004	3 2 1 N	_____	_____
28. Make visual comparisons and discriminations and see slight differences (P-form perception)	470696C005	3 2 1 N	_____	_____
29. Coordinate eyes and hands or fingers rapidly and accurately (K-motor coordination)	470696C006	3 2 1 N	_____	_____
30. Make a movement response accurately and swiftly (K-motor coordination)	470696C007	3 2 1 N	_____	_____
31. Move the fingers and manipulate small objects with the fingers, rapidly or accurately (F-finger dexterity)	470696C008	3 2 1 N	_____	_____
32. Making generalizations, evaluations, or decisions based on measurable or verifiable criteria	470696D001	3 2 1 N	_____	_____
33. Situations requiring the precise attainment of set limits, tolerances, or standards	470696D002	3 2 1 N	_____	_____
34. Identify basic hand tools and equipment	470696E001	3 2 1 N	_____	_____
35. Use basic hand tools and equipment	470696E002	3 2 1 N	_____	_____
36. Demonstrate knowledge of basic safety concepts	470696E003	3 2 1 N	_____	_____

AGRICULTURAL POWER I/AGRICULTURAL MACHINERY
AND SMALL ENGINE REPAIR VOCABULARY LIST

AIR CLEANER	filter that cleans the air before it enters the carburetor
BREATHER	device used to maintain a vacuum in a crankcase
CARBURETOR	mixes air and fuel in the correct amount to burn in the engine
CRANKCASE	part of the engine that supports the crankshaft
CRANKSHAFT	an offset shaft to which the piston and connecting rod are attached
CYLINDER BLOCK	the largest part of the engine which contains the cylinder
CYLINDER HEAD	the top of the cylinder block which contains the spark plug and cylinder
FUEL TANK	container for gasoline
KILL SWITCH	metal part used to stop the engine
MUFFLER	used to reduce engine noise
OIL FILTER PLUG	plug that covers the hole where the oil is added to the crankcase
OPERATOR'S MANUAL	used to look up detailed information about a specific small engine
SPARK PLUG	produces a spark to ignite the air and fuel from the carburetor

TOOL LIST FOR AGRICULTURAL POWER I/AGRICULTURAL
MACHINERY AND SMALL ENGINE REPAIR

Adjustable wrench	Offset screwdriver
Allen wrench	Open-end wrench
Box-end wrench	Phillips screwdriver
Ball peen hammer	Piston stop
Cutting pliers	Sockets (standard and deep)
Flat blade screwdriver	Socket wrench
Flat feeler gauge	Soft face hammer
Flywheel holder	Starter clutch wrench
Flywheel puller	Torque wrench
Longnose pliers	Wire feeler gauge

AGRICULTURAL POWER I/AGRICULTURAL MACHINERY
AND SMALL ENGINE REPAIR

Math Skills

Count two-place numbers
Add two-place numbers
Subtract two-place numbers
Perform standard units of measurement,
i.e., cup, pint, quart, inch, foot,
yard, ounce, pound
Use basic measuring instruments, i.e.,
rulers, scales
Multiply two-place numbers

Divide two-place numbers
Add common fractions
Subtract common fractions
Multiply common fractions
Divide common fractions
Add two-place decimals
Subtract two-place decimals
Multiply two-place decimals
Divide two-place decimals

NOTE: Many math books and workbooks provide needed direction in learning basic operations in math. This section assumes that students have basic skills and is designed to be used in conjunction with any of the math books you might be using, or to establish your own supplemental units. Any math practice activities should be developed within the context of the vocational program. Other persons to use as resources in this area include: parents, math teacher, and industrial arts teacher.

1. Given several different sizes of containers, student will fill the containers $\frac{1}{4}$ full.
2. Given several different sizes of nuts and/or bolts, student will choose the correct size wrench to tighten/loosen the nut/bolt.
3. Given a flat or wire feeler gauge, the student will correctly measure items given to him/her and state this measurement either in writing or verbally. (Items which students measure should have small gaps in them, such as an old spark plug, gaps in window casings or doors, gaps in desk drawers, etc.).
4. Student will be able to distinguish between the terms "clockwise" and "counterclockwise" and demonstrate the knowledge of turning a screw correctly upon request.
5. Student will be able to convert fractions to decimals and decimals to fractions.
6. Given the formula to figure piston displacement, student will be able to substitute numbers into the formula and correctly solve 80% of the worksheet problems (SER #1) using a calculator.

Answers to Worksheet SER #1:

- | | |
|---------------------|----------|
| 1. 14.1372 or 14.14 | 4. 9.50 |
| 2. 6.2832 or 6.28 | 5. 10.62 |
| 3. 9.82 | |

SUGGESTIONS FOR PARENTS:

1. Encourage student to use different kinds of measurement tools accurately (tape measure, measuring cups and spoons).
2. Encourage student to use math in daily living. For example, figuring the discount on items advertised in the newspaper, figuring the cost of gasoline for a certain number of gallons, etc.

WORKSHEET

PISTON DISPLACEMENT

The formula for figuring piston displacement is:

$$\text{DISPLACEMENT} = \frac{(\text{BORE})^2}{4} \times \pi \times \text{STROKE} \quad [\pi = 3.1416]$$

EXAMPLE:

What is the displacement of a piston which has a 2" bore and a 2" stroke?

$$\begin{aligned} \text{DISPLACEMENT} &= \frac{(2)^2}{4} \times 3.1416 \times 2 \\ &= \frac{2 \times 2}{4} \times 3.1416 \times 2 \\ &= \frac{4}{4} \times 3.1416 \times 2 \\ &= 1 \times 3.1416 \times 2 \\ &= 6.2832 \\ &= 6.28 \text{ cubic inches} \end{aligned}$$

PROBLEMS: Show your work.

1. What is the displacement of a piston which has a 3" bore and a 2" stroke?

2. What is the displacement of a piston which has a 2" bore and a 2" stroke?

3. What is the displacement of a piston which has a 2.5" bore and a 2" stroke?

4. What is the displacement of a piston which has a 2.2" bore and a 2.5" stroke?

5. What is the displacement of a piston which has a 2.6" bore and a 2" stroke?

AGRICULTURAL POWER I/AGRICULTURAL MACHINERY
AND SMALL ENGINE REPAIR

Physical Demands/Working Environment

Lift 50 lbs. maximum with frequent lifting and/or carrying of objects weighing up to 25 lbs. (Medium work)
Extend the hands and arms in any direction (reaching)
Seize, hold, grasp, turn or otherwise work with the hand or hands (handling)
Pick, pinch, or otherwise work with the fingers (fingering)
Perceive size, shape, temperature or texture of objects and materials by using fingertips (feeling)
Ability to work inside
Ability to work in extreme noise, constant or intermittent, causing marked distraction or possibly injury to hearing
Ability to work in extreme vibration, i.e., strain on body or extremities from repeated motion or shock

In most cases, the assessment of these skills will indicate that the student has the gross and fine motor skills which are prerequisites to learning the vocational skills in a Agricultural Power program. Prior to instruction in any physical demands activities, the student should have been evaluated and parents contacted to make sure that the student has no hidden physical problems that could be aggravated by lifting objects or by other physical activities done in this area. However, if the student has a physical disability or other limitation(s) preventing him/her from demonstrating fine and gross motor skills, then other techniques may be taught so he/she can perform in the vocational program. Other persons to use as resources in this area include: physical education teacher, industrial arts teacher, special education teacher, and parents.

1. Given objects weighing 10 lbs., 20 lbs., 30 lbs., 40 lbs., and 50 lbs., student will demonstrate ability to properly lift and carry the item at least 10 feet.
2. Given a set of tools and a tool box, student will sort the tools, assemble them into the toolbox and close the box. (Any number of items and boxes can be utilized for this activity. If tools are used, student can also identify the tools and check them off on an inventory sheet. The industrial arts teacher may have an inventory already developed which the student could complete).
3. Given small screws and washers, student will sort them according to size and shape, and put them into bags or containers.
4. If an assortment of nuts and bolts are available, student could assemble several nuts and bolts, with and without looking at the assembly. Many times nuts must be put onto bolts by touch only.
5. Visit an engine repair shop and discuss with student the noise level and vibration level of the shop and how well he or she could work all day long in that environment.

SUGGESTIONS FOR PARENTS:

1. Report the ability of student to work indoors in a shop area: i.e., the garage, the basement, etc.
2. Report how student reacts to loud noise or vibration. (Using vacuum cleaner, mowing the yard, using sewing machine, etc.).

AGRICULTURAL POWER I/AGRICULTURAL MACHINERY
AND SMALL ENGINE REPAIR

Aptitudes - indicates an ability to:

think visually of geometric forms (S-spatial)
comprehend the two dimensional representation of three-dimensional objects
(S-spatial)
recognize the relationship resulting from the movements of objects in space
(S-spatial)
perceive pertinent detail in objects in pictorial or graphic material (P-
form perception)
make visual comparisons and discriminations and see slight differences (P-
form perception)
coordinate eyes and hands or fingers rapidly and accurately (K-motor
coordination)
make a movement response accurately and swiftly (K-motor coordination)
move the fingers and manipulate small objects with the fingers, rapidly or
accurately (F-finger dexterity)

1. Student will correctly assemble a socket wrench.
2. Student will be able to correctly identify, by sight, the size of three different sockets or wrenches.
3. Given Worksheet SER #2 and instructions from the teacher, student will correctly answer 80% of the questions regarding the meaning of model numbers on engines.

Answers to Worksheet SER #2:

1. 32 cubic inch displacement
 2. plain bearing
 3. rope starter
 4. design series 6
 5. horizontal flo-jet (pneumatic governor)
 6. ball bearing
 7. alternator only
 8. 9 cubic inch displacement
 9. gear reduction (6 to 1)
 10. design series 8
 11. without starter
4. Given Worksheet SER #3, student will read the chart and answer the questions accurately.

Answers to Worksheet SER #3:

- | | |
|-----------------|-------------------|
| 1. 19122 | 6. 165 in. lbs. |
| 2. .005, .007 | 7. 1750 |
| 3. 65 ft lbs. | 8. 140000 |
| 4. 100 in. lbs. | 9. 220000, 250000 |
| 5. .012, .016 | 10. all of them |

5. Student will be able to identify major parts of a small engine after studying Worksheet SER #4.

SUGGESTIONS FOR PARENTS:

1. Report student's ability to handle tools such as a screwdriver, wrench and hammer.
2. Report student's ability to take apart and put things back together again (any item: toys, bicycles, etc.).

WORKSHEET

MODEL NUMBER SYSTEM

The chart below describes what each of the numbers in a model number mean. For example, the first 1 or 2 numbers show the cubic inch replacement. The next number shows the basic series design, and so forth. After studying the chart, answer the 11 questions. Your teacher will help you with the first question.

<u>CUBIC INCH DISPLACEMENT</u>	<u>FIRST DIGIT AFTER DISPLACEMENT</u>	<u>SECOND DIGIT AFTER DISPLACEMENT</u>	<u>THIRD DIGIT AFTER DISPLACEMENT</u>	<u>FOURTH DIGIT AFTER DISPLACEMENT</u>
	<u>BASIC DESIGN SERIES</u>	<u>CRANKSHAFT, CARBURETOR GOVERNOR</u>	<u>BEARINGS, REDUCTION GEARS & AUXILIARY DRIVES</u>	<u>TYPE OF STARTER</u>
6	0	0 -	0 - Plain Bearing	0 - Without Starter
8	1	1 - Horizontal	1 - Flange Mounting	1 - Rope Starter
9	2	Vacu-Jet	Plain Bearing	
10	3	2 - Horizontal	2 - Ball Bearing	2 - Rewind Starter
11	4	Pulsa-Jet		
13	5	3 - Horizontal (Pneumatic Governor)	3 - Flange Mounting	3 - Electric - 110 Volt, Gear Drive
14	6	Flo-Jet	Ball Bearing	4 - Elec. Starter-Generator - 12 Volt, Belt Drive
17	7	4 - Horizontal (Mechanical Governor)	4 -	5 - Electric Starter Only - 12 Volt, Gear Drive
19	8	Flo-Jet		6 - Alternator Only *
20	9			
23		5 - Vertical	5 - Gear Reduction (6 to 1)	7 - Electric Starter, 12 Volt Gear Drive, with Alternator
24		Vacu-Jet		8 - Vertical-pull Starter
25				
30		6 -	6 - Gear Reduction (6 to 1)	
32			Reverse Rotation	
		7 - Vertical	7 -	
		Flo-Jet		
		8 -	8 - Auxiliary Drive Perpendicular to Crankshaft	
			9 - Auxiliary Drive Parallel to Crankshaft	
		9 - Vertical		
		Pulsa-Jet		

* Digit 6 formerly used for "Wind-Up" Starter on 60000, 80000 and 92000 Series

EXAMPLES

To identify Model 100202:

<u>10</u>	<u>0</u>	<u>2</u>	<u>0</u>	<u>2</u>
10 Cubic Inch	Design Series 0	Horizontal Shaft- Pulsa-Jet Carburetor	Plain Bearing	Rewind Starter

Similarly, a Model 92998 is described as follows:

<u>9</u>	<u>2</u>	<u>9</u>	<u>9</u>	<u>8</u>
9 Cubic Inch	Design Series 2	Vertical Shaft- Pulsa-Jet Carburetor	Auxiliary Drive Parallel to Crankshaft	Vertical Pull Starter

1. In the model 324522, the number 32 means: _____
2. In the model 148907, the 0 means: _____
3. In the model 103861, the 1 means: _____
4. In the model 86304, the 6 means: _____
5. In the model 203194, the 3 means: _____
6. In the model 176724, the 2 means: _____
7. In the model 244576, the 6 means: _____
8. In the model 98998, the first 9 means: _____
9. In the model 257656, the second 5 means: _____
10. In the model 68433, the 8 means: _____
11. In the model 300300, the last 0 means: _____

SOURCE: Service and Repair Instruction, Briggs and Stratton.

WORKSHEET

CHART READING

Find the answers to the questions below by reading the chart.

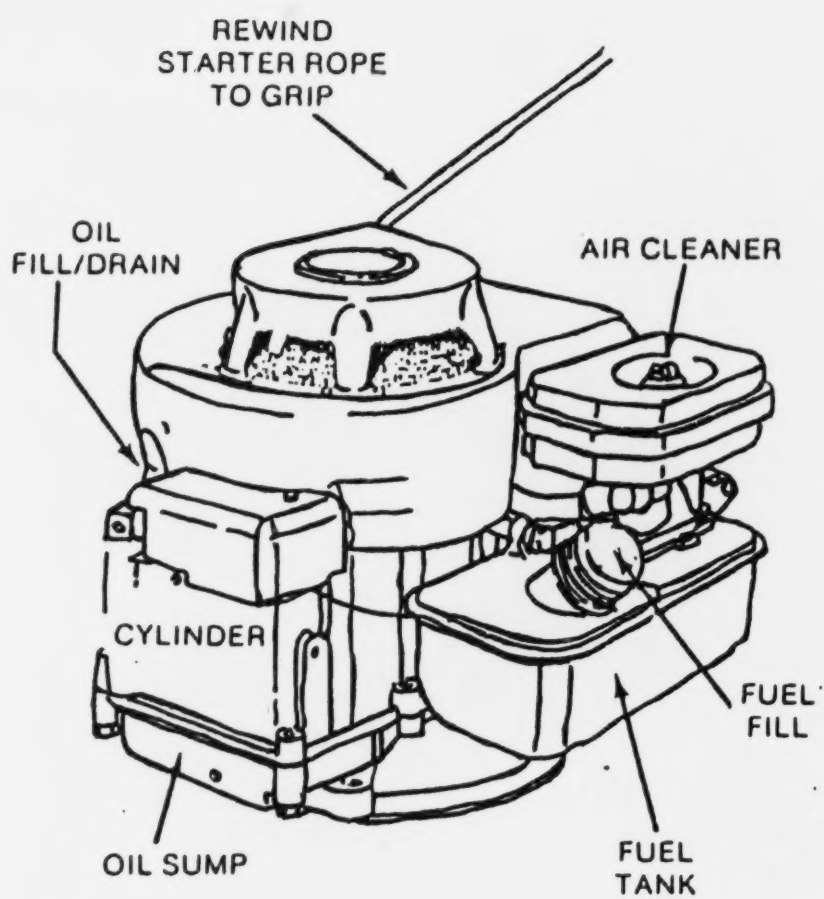
	BASIC MODEL SERIES	IDLE SPEED	ARMATURE		VALVE CLEARANCE		VALVE GUIDE REJECT GAGE	TORQUE SPECIFICATIONS		
			TWO LEG AIR GAP	THREE LEG AIR GAP	INTAKE	EXHAUST		FLYWHEEL NUT FT. LBS.	CYLINDER HEAD IN. LBS.	CONN. ROD IN. LBS.
A L U M I N U M	6B, 60000	1750	.006 .010	.012 .016	.005 .007	.009 .011	19122	55	140	100
	8B, 80000, 81000, 82000	1750	.006 .010	.012 .016	.005 .007	.009 .011	19122	55	140	100
	92000, 94000	1750	.006 .010		.005 .007	.009 .011	19122	55	140	100
	100000	1750	.010 .014	.012 .016	.005 .007	.009 .011	19122	60	140	100
	110000	1750	.006 .010		.005 .007	.009 .011	19122	55	140	100
	130000	1750	.010 .014		.005 .007	.009 .011	19122	60	140	100
	140000	1750	.010 .014	.016 .019	.005 .007	.009 .011	19151	65	165	165
	170000, 171700*	1750 **	.010 .014		.005 .007	.009 .011	19151	65	165	165
	190000, 191700*	1750 **	.010 .014		.005 .007	.009 .011	19151	65	165	165
	220000, 250000	1750 **	.010 .014		.005 .007	.009 .011	19151	65	165	190

1. The basic model series 110000 has a valve guide reject gauge of _____.
2. The intake valve clearance in the model 920000, 940000 is between _____ and _____.
3. In the 220000 and 250000 series, the flywheel nut torque specification is _____.
4. In the 130000 series, the connecting rod inch torque specification is _____.
5. In the 6B series, the three leg air gap is between _____ and _____.
6. In the 171700 series, the cylinder head torque specification is _____.
7. In the 100000 series, the idle speed is _____.

8. The three leg air gaps of .016 to .019 is found in what model? _____
9. Which two model series have a connecting rod torque specification of 190 in. lbs.? _____
10. Which model series have an exhaust valve clearance of .009 and .011?

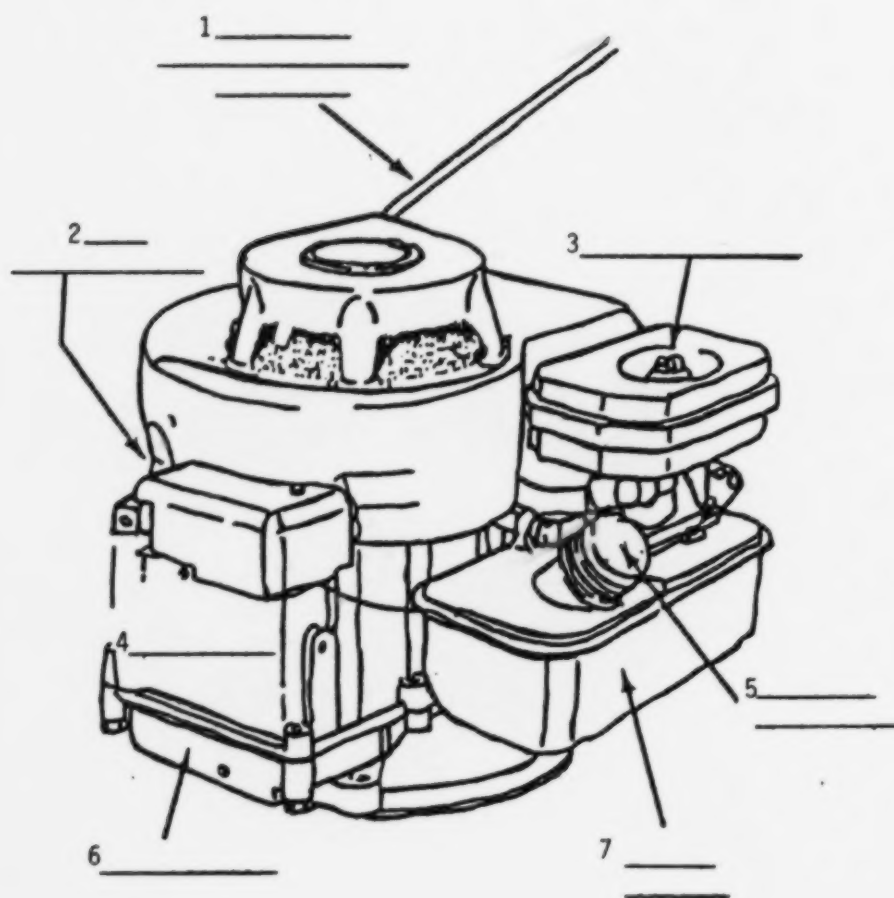
WORKSHEET

ENGINE PARTS - STUDY GUIDE



SER #4
cont.

WORKSHEET
ENGINE PARTS - IDENTIFICATION



AGRICULTURAL POWER I/AGRICULTURAL MACHINERY
AND SMALL ENGINE REPAIR

Temperament - indicates an ability to adapt to:

making generalizations, evaluations, or decisions based on measurable or verifiable criteria
situations requiring the precise attainment of set limits, tolerances, or standards

1. Given the worksheets for this area, student will answer all questions with 100 % accuracy.
2. Student will list the reasons that he/she must be very accurate when repairing an engine.

For example:

- (a) engine will not run
- (b) engine will break down again
- (c) other parts may be ruined if one part is not fixed correctly
- (d) a part could come off and hurt the operator
- (e) gasoline/oil may leak out and cause a fire

3. Given Worksheet SER #5 and SER #6, student will be able to identify the safety problems depicted in the pictures after studying the safety worksheet.

SUGGESTIONS FOR PARENTS:

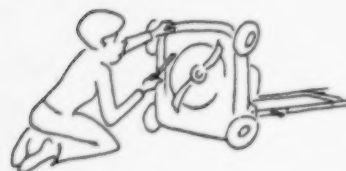
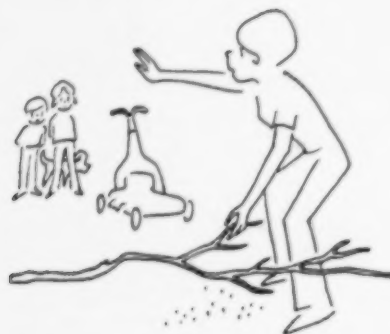
1. Give student the opportunity to make decisions based on criteria; for example, have student determine if lawn is free of sticks and debris before mowing.
2. Demand high quality work from student on all assigned chores.

WORKSHEET
SAFETY RULES

1. DO NOT allow children in yard when mower is operating.
2. DO NOT allow children to operate mower.
3. Keep the area clear of all persons, particularly small children, and pets.
4. Thoroughly inspect the area where the mower is to be used and remove all stones, sticks, wire, bones and other foreign objects. Also note the location of holes, stumps, and other possible hazards.
5. Do not operate mower when barefoot or wearing open sandals. Always wear substantial footwear and long pants.
6. Never attempt to make a wheel height adjustment while the engine is running.
7. When mowing over rough ground or in tall grass, mower must be set in highest cutting position.
8. Mow only in daylight or in good artificial light.
9. Never operate mower in wet grass. Always be sure of your footing; keep a firm hold on the handle and walk; never run.
10. Do not put hands or feet near or under rotating parts. Keep clear of discharge area while engine is running.
11. Stop engine when crossing gravel drives, walks, or roads, and under any conditions where thrown objects might be a hazard.
12. Stop engine whenever you leave the operating position behind the handle for any reason, including emptying grass bag and making any adjustments, repairs, or inspections.
13. Before cleaning, repairing or inspecting, make certain blade and all moving parts have stopped. Disconnect and secure spark plug wire away from plug to prevent accidental starting.
14. Keep all nuts, bolts, and screws tight to be sure mower is in safe operating condition.
15. To reduce fire hazard, keep mower free of grass, leaves or excessive grease.
16. Do not leave mower running unattended.

WORKSHEET

IDENTIFICATION OF SAFETY PROBLEMS



Circle the pictures which show a safety problem.

AGRICULTURAL POWER I/AGRICULTURAL MACHINERY
AND SMALL ENGINE REPAIR

Vocational

Identify basic hand tools and equipment
Use basic hand tools and equipment
Demonstrate knowledge of basic safety concepts

1. Student will be able to list five safety factors to observe in a shop area, such as wearing safety glasses, correct clothing and shoes, keeping clothing away from moving parts, cleaning up gasoline spills and oil spills, turning an engine off while checking gas and oil, never starting an engine in a closed area, disconnecting the spark plug when working on the engine and using the proper tools.
2. Student will visit a small engine repair shop (or vocational class) and note the safety factors she/he observes there.
3. Student will discuss how and when to use a fire extinguisher. A guest speaker may be helpful to introduce students to the use of fire extinguishers.
4. Student will discuss the reasons for cleaning up an area after working in relation to safety factors.

SUGGESTIONS FOR PARENTS:

1. Encourage the student to clean up tools and work area after use.
2. Observe the student filling a gasoline can and adding gas to a lawn mower. Discuss any poor safety practices.
3. Read and discuss various parts of an Owner's Manual for a lawnmower, chain saw, etc., with the student in relation to safety factors.

RESOURCES

AGRICULTURAL POWER I/AGRICULTURAL MACHINERY AND SMALL ENGINE REPAIR

Briggs & Stratton Corp.
12301 W. Wirth Street
Wauwatosa, WI 53222

Service and Repair Instructions

Instructional Materials Lab
908 Woodson Way
University of Missouri-Columbia
Columbia, MO 65211

Maintaining Small Engines: Vocational Preparation Curriculum, Herd, A.

HORTICULTURE/LANDSCAPING

Sample Occupational Areas:

Florist
Horticulture Worker I
Horticulture Worker II
Manager, Nursery
Nursery Laborer

Introduction

Horticulture is an area which covers a wide range of entry level jobs. Students can be trained to perform a variety of duties within this occupation. The ACCESS SKILLS for landscaping are the same as those for the horticulture area.

Students wishing to enter these occupational areas need to have good discrimination skills, an ability to follow verbal directions, and a strong interest in plants. Creativity is desired in flower arranging and landscape design. In most horticulture classes there is a great deal of memorization (names of plants). Students should realize that the jobs in these occupations usually require working both indoors and outdoors, use of chemicals and, sometimes, heavy lifting.

VIMS COMPETENCIES FOR HORTICULTURE

A. Plant and Plant Product Identification

1. Identify nursery plants
 2. Identify floriculture crops
 3. Identify fruits and nuts
 4. Identify turf grasses
 5. Identify vegetables
- Other (specify):

B. Maintaining Established Plants

1. Maintain lawns and turf
 2. Maintain orchards and vineyards
 3. Maintain ornamentals
 4. Maintain small fruits and vegetables
 5. Maintain floriculture crops
 6. Maintain interiorscaping plants
- Other (specify):

C. Landscaping and Interiorscaping

1. Develop design
 2. Develop public area
 3. Develop service area
 4. Develop private and family area
 5. Choose corner plantings
 6. Choose entrance plantings
 7. Choose foundation plantings
 8. Choose ground cover plantings
 9. Determine areas appropriate for planting
 10. Determine planting patterns
 11. Interpret landscape/interiorscape plans
- Other (specify):

D. Floral Design

1. Use correct floral design terminology
2. Identify common tools and mechanics used in arranging flowers
3. Identify the types of flowers that can be used in floral design
4. Identify the basic principals of floral design
5. Identify the basic floral design shapes
6. Design a fresh floral arrangement
7. Design a dried and/or silk floral arrangement
8. Perform basic wiring techniques
9. Construct bows using basic ribbon widths
10. Construct different types of corsages
11. Construct different types of boutonnières
12. Construct a floral design using Christmas greens
13. Construct wedding floral designs
14. Construct funeral floral designs

15. Prepare, design, and plant a dish garden
 16. Prepare, design, and plant a terrarium
 17. Package florist flowers/arrangements for delivery
- Other (specify):

E. Preparation of Soils and Planting Media

1. Take soil samples
 2. Interpret data of soil sample analysis
 3. Prepare planting media (soilless mix)
 4. Sterilize (pasteurize) soils/soilless mixes
 5. Fertilize media/soil
 6. Plan/construct drainage system
 7. Apply lime and nutrients (organic and inorganic)
 8. Plan and prepare fields
 9. Plan and prepare beds
- Other (specify):

F. Preparation and Planting of Plants

1. Maintain dormant plants
 2. Prepare/plant seeds
 3. Prepare/plant bulbs, corms, tubers, rhizomes, and roots
 4. Prepare/transplant seedlings, cuttings, and stolens
 5. Prepare/transplant large plants
 6. Apply correct mulch
- Other (specify):

G. Propagation of Plants

1. Label plants
 2. Set time clocks for automatic mist propagation system
 3. Propagate plants by taking cuttings
 4. Propagate plants through layerage techniques
 5. Propagate plants by division
 6. Propagate plants by budding
 7. Propagate plants by grafting
 8. Remove propagated plants
 9. Handle propagated plants for shipping or receiving
- Other (specify):

H. Cultural and Environmental Control Practices

1. Pinch flowering plants
2. Disbud flowering plants

3. Prune plants
4. Apply growth regulating chemicals
5. Force bulbs (control temperature, moisture, and light)
6. Apply shade material
7. Install black cloth to regulate photoperiod
8. Provide the required light intensity and length for photoperiod control
9. Adjust or control closed environment temperature
10. Provide for low temperature control in fields
11. Provide for high temperature control in fields
12. Cultivate soils
13. Aerate compacted soils
14. Provide plant support
15. Apply granular fertilizer
16. Apply liquid fertilizer

Other (specify):

6. Treat harvested crops for reduction of spoilage

Other (specify):

L. Packaging, Storage, and Shipment

1. Grade for size and quality plants or plant products
2. Place plants or products in proper storage
3. Prepare invoices and shipping labels
4. Package orders for shipment
5. Assemble shipping cartons
6. Inventory plants or plant products
7. Observe federal and state shipping standards

Other (specify):

I. Irrigation Practices

1. Calculate amount/source of water needed
2. Set time control valves
3. Hand water plants
4. Regulate furrow irrigation
5. Regulate overhead irrigation
6. Regulate trickle irrigation

Other (specify):

M. Miscellaneous Maintenance and Repairs

1. Maintain gasoline engines
2. Maintain diesel engines
3. Maintain electric motors
4. Maintain large implements
5. Maintain small implements
6. Correctly store implements
7. Sharpen hand tools
8. Repair growing structures
9. Locate and report any malfunctions of liquid injection systems
10. Repair and maintain irrigation system
11. Repair and maintain spray equipment

Other (specify):

J. Plant Pest and Disease Control

1. Identify plant disease
2. Identify insect damage
3. Identify chemical and environmental damage
4. Identify mechanical damage
5. Identify weeds
6. Determine correct control procedures
7. Safely mix chemicals
8. Safely apply chemicals
9. Provide biological controls
10. Remove diseased plants
11. Remove weeds manually from crops
12. Remove weeds with mechanical aids
13. Set out poisoned bait to eradicate rodents
14. Safely store chemicals and equipment

Other (specify):

K. Harvesting and Handling of Crops

1. Harvest plants or plant products at proper stage
2. Count plants or plant products
3. Clean and size harvested plants or plant products
4. Load plants for hauling
5. Dry harvested crops which require curing

**HORTICULTURE
ACCESS SKILLS CHECKLIST**

Student Name/ID _____ Sending School _____

Instructor _____ Date(s) Evaluated _____

Circle proper mastery code: 3 = MASTERY 2 = REQUIRES SUPERVISION
 1 = NOT MASTERED N or blank = NO EXPOSURE

<u>TASK DESCRIPTION</u>	<u>TASK ID #</u>	<u>MASTERY CODE</u>	<u>MASTERY DATE</u>	<u>RETRY CODE/DATE</u>
1. Count two-place numbers	010600A001	3 2 1 N	_____	_____
2. Add two-place numbers	010600A002	3 2 1 N	_____	_____
3. Subtract two-place numbers	010600A003	3 2 1 N	_____	_____
4. Perform standard units of measure ment, i.e., cup, pint, quart, inch, foot, yard, ounce, pound	010600A004	3 2 1 N	_____	_____
5. Use basic measuring instruments, i.e., rulers, scales	010600A005	3 2 1 N	_____	_____
6. Multiply two-place numbers	010600A006	3 2 1 N	_____	_____
7. Divide two-place numbers	010600A007	3 2 1 N	_____	_____
8. Add common fractions	010600A008	3 2 1 N	_____	_____
9. Subtract common fractions	010600A009	3 2 1 N	_____	_____
10. Multiply common fractions	010600A010	3 2 1 N	_____	_____
11. Divide common fractions	010600A011	3 2 1 N	_____	_____
12. Add two-place decimals	010600A012	3 2 1 N	_____	_____
13. Subtract two-place decimals	010600A013	3 2 1 N	_____	_____
14. Multiply two-place decimals	010600A014	3 2 1 N	_____	_____
15. Divide two-place decimals	010600A015	3 2 1 N	_____	_____
16. Lift 100 lbs. maximum with frequent lifting and/or carrying of objects weighing up to 50 lbs. (heavy work)	010600B001	3 2 1 N	_____	_____
17. Ascend or descend, i.e., ladders, stairs, scaffolding, using the feet and legs and/or hands and arms (climbing)	010600B002	3 2 1 N	_____	_____
18. Maintain body equilibrium to prevent falling when walking, standing, crouching or running (balancing)	010600B003	3 2 1 N	_____	_____
19. Bend body downward and forward by bending the spine at the waist (stooping)	010600B004	3 2 1 N	_____	_____
20. Bend legs at the knees to come to rest on the knee or knees (kneeling)	010600B005	3 2 1 N	_____	_____
21. Bend body downward and forward by bending the legs and spine (crouching)	010600B006	3 2 1 N	_____	_____
22. Move about on the hands and knees or hands and feet (crawling)	010600B007	3 2 1 N	_____	_____

HORTICULTURE
ACCESS SKILLS CHECKLIST

Student Name/ID _____ Sending School _____

Instructor _____ Date(s) Evaluated _____

Circle proper mastery code: 3 = MASTERY 2 = REQUIRES SUPERVISION
 1 = NOT MASTERED N or blank = NO EXPOSURE

<u>TASK DESCRIPTION</u>	<u>TASK ID #</u>	<u>MASTERY CODE</u>	<u>MASTERY DATE</u>	<u>RETRY CODE/DATE</u>
23. Extend the hands and arms in any direction (reaching)	010600B008	3 2 1 N	_____	_____
24. Seize, hold, grasp, turn or otherwise work with the hand or hands (handling)	010600B009	3 2 1 N	_____	_____
25. Pick, pinch, or otherwise work with the fingers (fingering)	010600B010	3 2 1 N	_____	_____
26. Perceive size, shape, temperature or texture of objects and materials by using fingertips (feeling)	010600B011	3 2 1 N	_____	_____
27. Ability to work both inside and outside	010600B012	3 2 1 N	_____	_____
28. Ability to work in wet and humid conditions	010600B013	3 2 1 N	_____	_____
29. Ability to work in hazardous conditions, i.e., fumes, odors, toxic conditions, dust and poor ventilation	010600B014	3 2 1 N	_____	_____
30. Think visually of geometric forms (S-spatial)	010600C001	3 2 1 N	_____	_____
31. Comprehend the two dimensional representation of three-dimensional objects (S-spatial)	010600C002	3 2 1 N	_____	_____
32. Recognize the relationship resulting from the movements of objects in space (S-spatial)	010600C003	3 2 1 N	_____	_____
33. Perceive pertinent detail in objects in pictorial or graphic material (P-form perception)	010600C004	3 2 1 N	_____	_____
34. Make visual comparisons and discriminations and see slight differences (P-form perception)	010600C005	3 2 1 N	_____	_____
35. Move the hands easily and skillfully (M-manual dexterity)	010600C006	3 2 1 N	_____	_____
36. Work with the hands in placing and turning motions (M-manual dexterity)	010600C007	3 2 1 N	_____	_____
37. Match or discriminate between colors	010600C008	3 2 1 N	_____	_____
38. Identify a particular color or color combination	010600C009	3 2 1 N	_____	_____
39. Perceive contrasting color combinations	010600C010	3 2 1 N	_____	_____
40. Dealing with people beyond giving and receiving instructions	010600D001	3 2 1 N	_____	_____

**HORTICULTURE
ACCESS SKILLS CHECKLIST**

Student Name/ID _____ Sending School _____

Instructor _____ Date(s) Evaluated _____

Circle proper mastery code: 3 = MASTERY 2 = REQUIRES SUPERVISION
 1 = NOT MASTERED N or blank = NO EXPOSURE

<u>TASK DESCRIPTION</u>	<u>TASK ID #</u>	<u>MASTERY CODE</u>	<u>MASTERY DATE</u>	<u>RETRY CODE/DATE</u>
41. Performing repetitive work, or performing continuously the same work, according to set procedures, sequences, or pace	010600D002	3 2 1 N	_____	_____
42. Identify basic hand tools and equipment	010600E001	3 2 1 N	_____	_____
43. Use basic hand tools and equipment	010600E002	3 2 1 N	_____	_____
44. Demonstrate knowledge of basic safety concepts	010600E003	3 2 1 N	_____	_____

HORTICULTURE/LANDSCAPING VOCABULARY LIST

ACID SOIL	a soil with a pH of below 7
ALKALINE SOIL	a soil with a pH of above 7
ANNUAL	when speaking of garden flowers, this term refers to plants that are grown for only one season
BLUEGRASS	type of grass generally grown in yards (also fescue)
BULB	an underground bud with roots growing from the bottom
CUTTINGS	small parts cut off a plant, usually pieces of stem with their leaves
DORMANT	alive, but not growing
DRENCH, THEN DRY	soak roots thoroughly, then allow soil to dry out before watering again
EVENLY MOIST	frequent watering required, but must never stand in water
FERTILIZER	chemicals used in the soil to make sure the plants growing there have enough nutrients to grow
FESCUE	type of grass generally grown in yards (also blue-grass)
FLORICULTURE	producing, marketing, using and selling of flowers and flowering plants
FUNGICIDES	chemicals that prevent certain plant diseases
GROWING MEDIUM	a soil mix used for growing plants
HERBICIDES	chemicals that kill weeds and other unwanted plants
HUMUS	soil which is high in organic matter
INSECTICIDES	chemicals that kill insect pests on plants or in the soil
LANDSCAPING	the art of arranging land and landscape for human use and enjoyment
LOAM	a good garden soil; about 1/3 soil, 1/3 organic matter and 1/3 sand

MULCH	material like straw, burlap, peat moss or sawdust which is used to cover newly planted seeds or to protect plants during the winter months
PEAT	a soft spongy mixture which is mixed with soil
PERENNIAL	plants that rebloom or grow every season
POLLINATION	fertilizing plants by transferring pollen from one plant or flower to another
PROPAGATION	getting a lot of plants from one or a few plants
PRUNE	cutting off parts of a tree or plant in order to help it grow better
THOROUGHLY WET	daily watering generally required
TRANSPLANTING	process of moving seedlings or mature plants from one place to another

TOOL LIST FOR HORTICULTURE/LANDSCAPING

ax	pruning saw
chain saw	push broom
electric hedge trimmer	round-pointed shovel
florist shears	ruler
hammer	scoop shovel
hand pruner	screwdriver
hedge trimmer	snow shovel
hoe	sod tamper
lawn mower	spade
lawn rake	spreader
lawn roller	square-pointed shovel
lawn sprinkler	steel rake
lawn trimmer	trowel
lopping shears	water can
mallet	water hose
pliers	wheelbarrow
post-hole digger	wrenches
power tiller	

HORTICULTURE/LANDSCAPING

Math Skills

Count two-place numbers
Add two-place numbers
Subtract two-place numbers
Perform standard units of measurement,
i.e., cup, pint, quart, inch, foot,
yard, ounce, pound
Use basic measuring instruments,
i.e., rulers, scales
Multiply two-place numbers

Divide two-place numbers
Add common fractions
Subtract common fractions
Multiply common fractions
Divide common fractions
Add two-place decimals
Subtract two-place decimals
Multiply two-place decimals
Divide two-place decimals

NOTE: Many math books and workbooks provide needed direction in learning basic operations in math. This section assumes that students have basic skills and is designed to be used in conjunction with any of the math books you might be using, or to establish your own supplemental units. Any math practice activities should be developed within the context of the vocational program. Other persons to use as resources in this area include: parents, math teacher, science teacher, and agriculture teacher.

1. Given a rain gauge or other type of measuring device, student will be able to read it accurately.
2. Given a chart and answer sheet (Worksheet H/L #1), student will determine the correct quantity of chemicals to use for the problems presented with 80% accuracy.

Answers to Worksheet H/L #1:

- | | |
|-------------------|--------------------------------|
| 1. 9 tablespoons | 4. 10 cups |
| 2. 1/2 pound | 5. 45 tablespoons or 3/5 pound |
| 3. 1/2 tablespoon | 6. 10 cups |
3. Given three different soil mixtures, student will produce a combined mixture in the following proportions:
 - 1 part pasteurized soil
 - 1 part peat
 - 2 parts sand (vermiculite or perlite)
 4. Student will be able to measure accurately three items designated by teacher, using a tape measure.
 5. Given problems from supplementary materials, student will be able to figure the area with 80% accuracy.

6. Given the area of a lawn to seed, student will determine how much seed needs to be purchased.

SUGGESTIONS FOR PARENTS:

1. Encourage student to use measuring devices accurately.
2. Discuss the meaning of an hourly wage and have student figure what his/her wages would be at different salary levels.

WORKSHEET

Spray Materials and Rate Chart

Materials	Quantity to Use Per	
	Gallon level tablespoons	25 Gallons pounds
INSECTICIDES		
(wetable powders)		
50% carbaryl (Sevin)	1 2/3	1/2
40% chlordane	2	3/4
50% diazinon	1	1/4
35% kelthane	1	1/4
25% malathion-1	1 2/3	3/4
25% malathion-2	3	1 1/2
50% methoxychlor-1	2	1/2
50% methoxychlor-2	4	1
FUNGICIDES		
(wetable powders)		
50% captan-1	2/3	1/4
50% captan-2	1 1/3	1/2
50% captan-3	3	1 1/4
76% ferbam-1	1 2/3	1/4
76% ferbam-2	3	1/2
50% folpet	1	1/4
Mancozeb	1	1/4
Sulfur (microfine)	3	1 1/2
75% zineb	2/3	1/4
DORMANT SPRAYS		
Liquid lime sulfur	2 cups	3 gallons
Dormant or Miscible Oils	1/2 cups	3 quarts

1. How much malathion-2 would be needed to produce 3 gallons of insecticide? _____
2. How much ferbam-1 would be needed to produce 50 gallon? _____
3. How much diazinon would be needed to produce 1/2 gallon? _____
4. How much liquid lime sulphur would be needed to produce 5 gallons?

5. How much sulphur would be needed to produce 15 gallons? _____
6. How much dormant or miscible oil would be needed to produce 10 gallons?

HORTICULTURE/LANDSCAPING

Physical Demands/Working Environment

Lift 100 lbs. maximum with frequent lifting and/or carrying of objects weighing up to 50 lbs. (heavy work)
Ascend or descend, i.e., ladders, stairs, scaffolding, using the feet and legs and/or hands and arms (climbing)
Maintain body equilibrium to prevent falling when walking, standing, crouching or running (balancing)
Bend body downward and forward by bending the spine at the waist (stooping)
Bend legs at the knees to come to rest on the knee or knees (kneeling)
Bend body downward and forward by bending the legs and spine (crouching)
Move about on the hands and knees or hands and feet (crawling)
Extend the hands and arms in any direction (reaching)
Seize, hold, grasp, turn or otherwise work with the hand or hands (handling)
Pick, pinch, or otherwise work with the fingers (fingering)
Perceive size, shape, temperature or texture of objects and materials by using fingertips (feeling)
Ability to work in both inside and outside
Ability to work in wet and humid conditions
Ability to work in hazardous conditions, i.e., fumes, odors, toxic conditions, dust and poor ventilation

In most cases, the assessment of these skills will indicate that the student has the gross and fine motor skills which are prerequisites to learning the vocational skills in a Horticulture program. Prior to instruction in any physical demands activities, the student should have been evaluated and parents contacted to make sure that the student has no hidden physical problems that could be aggravated by lifting objects or by other physical activities done in this area. However, if the student has a physical disability or other limitation(s) preventing him/her from demonstrating fine and gross motor skills, then other techniques may be taught so he/she can perform in the vocational program. Other persons to use as resources in this area include: physical education teacher, industrial arts teacher, agriculture teacher, special education teacher, and parents.

1. Given several different types of ribbon, student will be able to sort them according to texture, then again according to size.
2. Given a container, soil and seeds, student will plant seeds. Instructions for planting can be found on Worksheet H/L #2.
3. Student will visit a hardware store and lift and price 10, 15, 25 and 50 pound sacks of grass seed.
4. After demonstration, student will pinch leaves off a plant.
5. Given donated flowers, student will make a boutonniere following instructions on Worksheet H/L #3.

SUGGESTIONS FOR PARENTS:

1. Allow student to fill lawn mower with gasoline and oil.
2. Report how student reacts to working outdoors on warm, humid days.
3. Encourage student to water house plants and check that it is done properly.
4. Report on student's ability to hoe a garden or rake a yard.
5. Report on student's ability to climb a ladder.
6. Report on any allergies of the student to chemicals, dust or odors.

WORKSHEET

Instructions for Planting Seeds

1. Fill the container up to 3/4 inch from the top with the mixture to be used. It should be moistened before filling if the mixture is dry. Make sure the container has adequate drainage. Before filling, cover holes or cracks in the container with sphagnum moss or broken crockery.
2. Level, and gently firm the planting medium. A clean small board may be used for leveling and firming.
3. Using a narrow board or large wooden label, make shallow rows about 1 to 2 inches apart in the flat. When different seeds are used in the same container, they are easier to keep track of if planted in rows. If only one type of seed is used, it may be scattered or "broadcast" over the surface.
4. Sow the seeds uniformly and thinly in the rows. Many small round seeds may be slowly dropped in the rows by tapping the package as it is held over the rows. Level each row promptly with plant type, variety, and date of planting.

Large seeded vegetables such as cucumber, cantaloupe, and watermelon should be planted directly into peat pots. Other seeds may also be handled this way to save transplanting, but sowing is difficult with very small seeds. Some small seeds are now available in "pelletized form" to make handling easier. Plant two seeds per pot and later thin to one plant. This saves transplanting, and means less root damage at planting time.

5. Cover the seeds with dry vermiculite, or milled sphagnum moss. The depth of covering depends on the size of the seeds. Very fine seeds such as petunia or begonia need not be covered. Moisten the surface with a fine mist, or place the container in a pan of warm water to absorb it from the base. Don't place in water that is deep enough to run over the top of the pot or flat. It may mix seeds or cover them too deeply. As a general rule, seeds other than the very fine seeds should be covered about two times their diameter.
6. Slip the flats or containers into clear plastic bags. Since they retain moisture no additional watering should be necessary until after seeds have germinated.
7. Place seeds in a warm location for germination. Generally a range from 65 to 75 degrees F. is best. A few plants such as larkspur,

snapdragon, sweet pea, cabbage, broccoli, and cauliflower are best started at about 55 degrees. Don't place covered containers in direct sunlight.

8. Watch daily for germination. Containers should be moved to bright light, and the plastic bags removed as soon as germination is well under way. If not all seeds germinate at the same time, cut strips of plastic or cloth, and keep undergerminated rows covered until seedlings appear. Seeds are quickly killed if allowed to dry during germination. Watch closely for development of any disease, and control promptly. After germination, those plants listed as preferring cool temperatures should be placed in a cool location.

2. Put a 2- or 2 1/2-inch piece of fern with the flower.



3. Wrap the fern and the flower together with florist's tape



WORKSHEET

Objective: To make a boutonniere.



Flower



Fern

Materials Needed

Florist's
TapeBoutonniere
Pin

1. Cut the stem off, leaving about one inch attached to the flower head.

HORTICULTURE/LANDSCAPING

Aptitudes - indicates an ability to:

think visually of geometric forms (S-spatial)
comprehend the two dimensional representation of three-dimensional objects
(S-spatial)
recognize the relationship resulting from the movements of objects in space
(S-spatial)
perceive pertinent detail in objects in pictorial or graphic material (P-
form perception)
make visual comparisons and discriminations and see slight differences (P-
form perception)
move the hands easily and skillfully (M-manual dexterity)
work with the hands in placing and turning motions (M-manual dexterity)
match or discriminate between colors
identify a particular color or color combination
perceive contrasting color combinations

1. Given a chart and answer sheet (Worksheet H/L #4), student will find the answers on the chart and correctly record them with 90% accuracy.

Answers to Worksheet H/L #4:

- | | |
|----------------|------------|
| 1. 70-80 days | 4. 23 mg. |
| 2. 5-10 plants | 5. 1/8 oz. |
| 3. 3 inches | 6. 1/4" |

2. Student will follow written or verbal instructions and press a flower. Instructions for the teacher can be found on Worksheet H/L #5.
3. Student will follow written or verbal instructions, cut a piece of plant from a parent plant and allow it to root in water. Student will be able to decide when the cutting is ready for planting in soil. Instructions for the teacher can be found in Worksheet H/L #6.
4. Invite a florist to class to demonstrate flower arranging. Some florists may be willing to give old flowers for student practice in arrangement.
5. Given worksheet and prior instruction (Worksheet H/L #7), student will be able to identify 3 out of 8 different narcissi by looking at the flowers.
6. Given several different types of ribbon, student will be able to sort them according to color.

7. Given a color chart, student will be able to identify colors and contrasting colors.

SUGGESTIONS FOR PARENTS:

1. Encourage student to grow a terrarium at home.
2. Assign lawn mowing as a summer chore.
3. Encourage student to grow a flower or vegetable garden.

WORKSHEET

Vegetable	Approx. Planting per Person per Year		Seed for 100 ft row	Min. Row Space (in.)		Inches Between Plants In Row	Depth to Plant (inches)	Days from Planting to Eating Stage	Vitamin Content*	
	Fresh	Process		Hand	Field				A I.U./100g.	C mg.
RICH IN VITAMINS A & C										
Spinach	5-10 ft	10-15 ft	1 ounce	18	42	3	1/4	40-50	11,790	30
Turnip greens	5-10 ft	10-15 ft	1/2 ounce	18	42	3	1/4	35-45	10,600	60
Collards	5-10 ft		1/2 ounce	24	42	12	1/4	85-95	7,630	44
Mustard greens	5-10 ft	10-15 ft	1/2 ounce	18	42	3	1/4	30-40	7,180	45
Cantaloupe	3-5 hills	3-5 hls	1/4 ounce	48	60	60	1/2	80-90	3,420	33
Broccoli	5-10 plants	5-10 pl	1/2 ounce	30	42	24		70-80	3,400	74
RICH IN VITAMIN A										
Carrot	5-10 ft	10-15 ft	1/4 ounce	18	42	3	1/4	70-85	12,500	5
Swiss Chard	5-10 ft	10-15 ft	2 ounces	18	42	3	1/2	55-65	9,690	17
Sweetpotato	10-20 pl	10-20 pl			30	42	12	150	9,510	23
Winter squash	3-5 hls		1/2 ounce	48	60	60	1/2	100	6,190	7
RICH IN VITAMIN C										
Tomato	3-5 pl	5-10 pl	1/8 ounce	48	60	36-----ground		75-90	1,100	23
				42	60	18-----staked		70-75		
Pepper	2-3 pl		1/8 ounce	30	42	18		70-80	740	99
Cabbage	3-5 pl	3-5 pl	1/4 ounce	24	42	12		70-80	90	31
Chinese cabbage	5-10 ft		1/2 ounce	24	42	6	1/4	75-80	260	31
Cauliflower	3-5 pl	5-10 pl	1/4 ounce	24	42	24		65-75	90	28

- How many days does it take a cabbage to grow and be ready to eat? _____
- How many plants of broccoli would you plant to feed one person fresh broccoli? _____
- How many inches should be between carrot plants? _____
- How many mg. of vitamin C is found in tomatoes? _____
- How much seed do you need to plant a 100 ft. row of peppers? _____
- How deep do you plant mustard greens? _____

WORKSHEET

Pressing a Flower

Pressing

Pressed flowers are especially suitable for flower pictures, as well as decoration on note paper, place cards and many other items.

Collecting for Pressing

Use flowers for pressing that are in prime condition. Also, use flowers with different stages of development up to full maturity for more variety in design. Avoid plants with fleshy stems and leaves as well as flowers with very thin petals. Don't try to press wilted materials. Flowers that are flat, such as pansies, press best.

Methods for Pressing

The faster flowers dry, the better they retain color. On the other hand, flowers can't be exposed to excessively high temperatures. Although they may dry quickly, they will turn brown.

Pressing requires sandwiching flowers and foliage between layers of an absorbent material. This should be clean, and hold the flowers firmly and flat during the drying process. Porous materials that allow some air movements are also beneficial.

Flowers are generally placed between a non-glossy type of paper. Newspapers, old telephone directories, or catalogs are suitable. Absorbent facial tissues placed on the pages aid rapid moisture absorption. Tissues should be removed and flower or foliage replaced between fresh, dry tissues and papers at the end of the first week. After the flowers and tissues have been placed in the folded newspapers or books, stack them several layers deep. Place boards beneath, and on top of the stack. Put the stack in a warm, dry place with a heavy weight on top.

Another very satisfactory system suitable for drying flowers uses a combination of cardboard, newspaper and desk-sized blotter pads. Corrugated cardboard is cut into sheets slightly larger than the sheets of folded newspaper. Flowers are positioned on one side of the opened newspaper. Then the newspaper is closed, and a sheet of blotter paper placed on either side.

After all flowers have been placed between the newspapers, blotter paper, and cardboard, the layers are stacked and tied, or taped together. They should then be placed in a warm, well ventilated place and weighted. If large numbers of flowers are pressed, write a date on the stacks to keep track of drying time. Special presses can be purchased or constructed for drying large quantities of materials.

How to Take Cuttings

Take cuttings from vigorous, healthy shoots. Most cuttings should be 4-6 inches long. Cut just below a node (point where a leaf is attached). Use a sharp, clean knife.

Remove leaves from the lower half of the cutting. Use a rooting hormone on all except easy-to-root plants such as coleus. Rooting compounds are available in many garden supply stores or from mail order seed and nursery companies. Carefully use the hormones as directed.

Keep cuttings clean. Don't place them in dirty containers or on dirty tables.

Identification of Daffodils

DIVISION 1. Trumpet narcissi--
Trumpet as long or longer than
the length of the petals.



DIVISION 2. Large-cupped narcissi--
Cup more than 1/3, but less than the
length of the petals.

DIVISION 3. Small cupped narcissi--
Cup less than 1/3 the length of the
petals.



DIVISION 4. Double narcissi--
Flowers with many petals.

DIVISION 5. *Triandrus narcissi*--
Hybrids of the *triandrus* species.
Usually cluster flowering with
white, somewhat pointed, slightly
reflexed petals.



DIVISION 6. *Cyclamineus narcissi*--
Hybrids of the species, *cyclamineus*.
Generally characterized by reflexed
petals.

DIVISION 7. *Jonquilla narcissi*--
Hybrids of the species, *jonquilla*.
Usually yellow, fragrant, and
cluster-flowering.



DIVISION 8. *Tazetta narcissi*--
Hybrids of the *tazetta* group.
Bunch flowered with flowers of
medium to small size.

HORTICULTURE/LANDSCAPING

Temperament - indicates an ability to adapt to:

dealing with people beyond giving and receiving instructions
performing repetitive work, or to performing continuously the same work,
according to set procedures, sequences, or pace

1. Student will pick weeds out of a certain area of school yard (done as a group activity or could be done at home).
2. Student will choose seeds from a seed catalog and role play ordering the seeds over the telephone.
3. Two students will role play a customer requesting a lawn mowing job. Students will discuss:
 - a. size of yard
 - b. time to do job
 - c. wages
 - d. extra work (trimming, pruning, raking)

SUGGESTIONS FOR PARENTS:

1. Discuss repetitive activities the student does and how he/she reacts to them.

HORTICULTURE/LANDSCAPING

Vocational

Identify basic tools and equipment

Use basic tools and equipment

Demonstrate knowledge of basic safety concepts

1. Student will be able to identify a garden hose, sprinkler and lawn mower.
2. Student will match pictures of tools on the tool list.
3. Student will be able to list five of eight safety rules when working with power equipment. (See Worksheet H/L #8).
4. Given procedures to follow for chemical poisoning (Worksheet H/L #9), student will verbally state what to do in the case of:
 - a. poison on the skin
 - b. chemical burns of the skin
 - c. poison in the eye
 - d. inhaled poisons

SUGGESTIONS FOR PARENTS:

1. Discuss general safety precautions concerning power tools.
2. Require student to clean and put tools away after use.
3. Given the tool list, state the tools the student is able to use well.

Safety Rules for Working with Power Equipment

1. Keep children, pets and adults a safe distance away from equipment being used.
2. Do not run over sticks or stones with the equipment.
3. Wear safety glasses.
4. Keep your hands and feet away from power equipment.
5. Never clean or remove grass, sticks or other trash caught in power equipment when the motor is running.
6. Stop the motor and unplug equipment before doing any repair work on it.
7. Wear heavy shoes when working with power lawn mowers.
8. Always follow the preventive maintenance suggestions before using power equipment.

WORKSHEET

Call a Doctor. The first thing to do in any poisoning is to call an ambulance or doctor. But if you are all alone with the victim, you must see that he/she is breathing and is away from further danger before leaving to make your phone call. Always save the chemical and the label for the doctor.

While Waiting, Do This For:

Poison on the Skin

- The faster the poison is washed off, the less injury will result.
- Drench skin and clothing with water (shower, hose, faucet, pond).
- Remove clothing.
- Clean skin and hair thoroughly with soap and water. Detergents and commercial cleansers are better than soap.
- Dry and wrap victim in blanket.
- WARNING: Do not allow any of the chemicals to get on you while you are helping the victim.

Chemical Burns of the Skin

- Wash with large quantities of running water.
- Remove contaminated clothing.
- Immediately cover loosely with a clean, soft cloth.
- Avoid use of ointments, greases, powders, and other drugs in first-aid treatment of burns.

Poison in the Eye

- It is important to wash the eye out as quickly but as gently as possible.
- Hold eyelids open, wash eyes with a gentle stream of clean running water.
- Continue washing for 15 minutes or more.
- Do not use chemicals or drugs in wash water. They may make the injury worse.

Inhaled Poisons (Dusts, Vapors, Gases)

- If victim is in an enclosed space, do not go in without an air-supplied respirator.
- Carry victim (do not let victim walk) to fresh air immediately.
- Open all doors and windows.
- Loosen all tight clothing.
- Apply artificial respiration if breathing has stopped or is irregular.
- Keep victim as quiet as possible.
- If victim is convulsing, protect him/her from falling and striking head. Keep victim's chin up so the air passage will remain free for breathing.
- Prevent chilling (wrap in blankets, but don't overheat).
- Do not give alcohol in any form.

SOURCE: Carrick, J. (1979). Planting, growing, caring. New Brunswick, NJ: Rutgers State University.

RESOURCES

HORTICULTURE/LANDSCAPING

Academic Support Center
505 E. Stewart Road
University of Missouri-Columbia
Columbia, MO 65211

Film: "A New Way to Lift"

Film: "Learning through Movement"

Curriculum Publications Clearinghouse
Western Illinois University
Horrabin Hall 46
Macomb, IL 61455

Career Exploration Booklets

Materials dealing with areas of career exploration for special needs students. The booklets deal with the following careers:

Agriculture, Autobody Repair Specialist, City Worker, Construction Worker, Day Care Center Teacher Aide, Food Store Worker, Hospital Worker, Hotel/Motel Worker, Janitorial Worker, Laundry Worker, Nursing Home Worker, Restaurant Worker, Retail Store Worker, Security Guard, Service Station Attendant, Transportation Worker. Materials include 16 information booklets, 16 evaluation booklets, and a teacher's manual.

Competency-Based Curriculum Guide in High School Horticulture

Designed as an introductory one semester course which can be used by those students with little or no background in horticulture. Intended for 10th, 11th, and 12th grade high school students before continuing in a more advanced ornamental horticulture program. The guide is divided into 12 units each consisting of a teacher page and corresponding student pages.

Shop Safety

A brief unit to instruct students on safety rules when working in the general shop. Includes nine-question pre-test, supplemental reading sheets (general shop safety rules, proper dress in the shop, proper work habits in the shop, proper fire protection in the shop, proper first-aid in the shop), seven worksheets for students to complete, self-test, and evaluation method. Written at low level, appropriate for special needs students, junior high students, or students with limited English proficiency.

Teaching Guide for Work-Related Activities

A guide which can be used in vocational training of trainable mentally handicapped students through a work-related class and concurrent work experience. Contents include knowledge of self, decision-making, career exploration, punctuality, work habits and attitudes, safety on the job, safety in the community, obtaining employment, your paycheck, managing your money, bibliography of resources, student analysis chart, and sample activities and worksheets. Can be used with Teaching Guide for Home Economics, Industrial Arts, and Vocational Projects.

Instructional Materials Laboratory
908 Woodson Way
University of Missouri-Columbia
Columbia, MO 65211

Greenhouse Worker, The

Contains information and instructions regarding operations in floriculture production. Provides suggested references, laboratory activities, vocabulary, sample tests, and transparency masters.

Grounds Keeping Equipment Volume I

Procedures for servicing and operating tractors ranging from riding lawn mowers to 100-horsepower tractors. Safety precautions for driving tractors are included.

Grounds Maintenance - Special Needs Curriculum

Ten units covering: winter maintenance, planting and caring for shrubs and trees, mathematics, and other related skills.

Occupational Curriculum Laboratory
East Texas State University
Commerce, TX 75428

Basic Life Skills

Contains ten units, which are Survival Skills, Income Tax, You and the Law, Communications, Banking, Consumerism, Credit, Budgeting, Insurance, and the Metric System. 472 pages.

Building Maintenance: Introduction

These five units of instruction have been developed for an orientation to the building maintenance area, and include such materials as leadership development, personal development, job application and interview, general safety, shop math, and measurement. 348 pages.

University of Missouri-Columbia
Extension Division
103 Whitten Hall
Columbia, MO 65211

Numerous short handouts on a variety of topics.

Vocational-Technical Curriculum Laboratory
Rutgers-The State University
Building 4103, Kelmer Campus
New Brunswick, NJ 08903

Planting, Growing, Caring, Carrick, J.

INSTRUCTIONAL MODULE

ACCESS SKILL: APPLY RATIO IN MIXTURES

VOCATIONAL AREA:
Horticulture
Landscaping

TASK ANALYSIS STEPS: A-D

ACTIVITY	MATERIALS/RESOURCES
TASK A: Student will be able to define and identify rates and ratios 1. Discuss the definitions of rate and ratio. Put them on the blackboard or on a transparency. Rate: a rate is a comparison of two different things. It usually includes the words for, per, to, or every. Ratio: The pair of numbers used to describe the rate is called ratio. 2. Give students examples of rates and ratios. Have one student read the rate and another read the ratio. For each rate, have them name the items being compared. 3. Divide the students into two groups. Have one group identify the ratios. Have the groups exchange places. 4. Have the students bring in articles which use the term rate or ratio. Some examples include population ratios, prices of food items, values of gold and silver. 5. Put the following examples of rates on the blackboard: girls to boys in your class boys to girls in your class Have the students identify the two ratios. Discuss why the two ratios are different. Give the students various rates and have them identify the rates. Make sure the students understand the order in which the numbers are compared is important. Divide the students into two groups. Have one student give the ratios and the other student act as the evaluator. After the students complete the worksheet, have them exchange places.	Worksheet A2 Worksheet A5
TASK B: Student will be able to read and write ratios 1. Have the students give a various rate such as 8 students present to 2 students absent. Write the ratio on the blackboard, 8 to 2. Tell the students there is another way to write this ratio. Write $8/2$ on the blackboard and have students read it. Repeat this for other rates. 2. Have the students give another rate such as 4 red for every 7 yellow. Write the ratio on the blackboard, $4/7$. Tell students there is still another way to write this ratio. Write $4:7$ on that blackboard and have the students read it. Repeat this for other rates. 3. Write the three ways to show the ratio on the blackboard. 4 to 7 $4/7$ $4:7$ Give the students various rates. Divide the students into two groups. Have one group write the ratios as fractions and the other group write the ratios like the example $4:7$.	Worksheet B3

ACTIVITY	MATERIALS/RESOURCES
TASK B: CONTINUED	
4. Have the students use the sports pages of newspapers to write ratios for wins to losses, losses to wins, and wins or losses to games played. Have them follow the two examples of $4/7$ or $4:7$.	Newspapers
TASK C: Student will be able to identify and write equivalent ratios	
1. Draw one circle and five squares on the blackboard. Have the students identify the ratio and write it on the blackboard. Draw another circle and 5 more squares on the blackboard. Have the students identify the ratio and write it on the blackboard. Repeat the procedure to show the ratio $3/15$ and $4/20$. Point out to students that $1/5$, $2/10$, $3/15$, and $4/20$ are equivalent ratios since they describe the same rate, circles to squares.	
2. Give the students tables of equivalent ratios to complete. After completing the exercise have the students read their answers, stressing reading each ratio correctly.	Worksheet C2
3. Give the students a copy of Worksheet C3. Go over the worksheet with them. Remind students that to find an equivalent ratio, the numerator and denominator of the known ratio must be multiplied by the same number. Give the students the following problem: Suppose you use 9 cups of fertilizer. How much water should you use? Have them find the answer (6 cups).	Worksheet C3
4. Give the students a copy of Worksheet C4. Go over the worksheet with them. Give students other ratios and have them find the equivalents: $9/12$, $4/24$, $8/20$.	Worksheet C4
5. Give the students various ratios in which they have to multiply and divide to find the equivalent ratios.	Worksheet C5
TASK D: Student will be able to write equivalent ratios in mixtures	
1. Give the students tables of equivalent ratios to complete using mixtures.	Worksheet D1
2. Give the students problems using mixtures in which more of one mixture is needed.	Worksheet D2
3. Give the students problems using mixtures in which less of one mixture is needed.	Worksheet D3
4. Bring in various mixtures for students to mix up such as cement, Kool-Aid, a cleaning solution, and recipes.	Cement, Kool-Aid, cleaning solution, buckets, pitchers, measuring spoons, cups
5. Role play the following situation: Have one student give the others a direction, such as "I want 3 quarts of Kool-Aid." Have the other students mix this up. Let the students take turns giving directions.	

Worksheet A2

<u>Rate</u>	<u>Ratio</u>
1. 2 cans of corn for .79	2 to 79
2. The car traveled 55 miles per hour	55 to 1
3. 4 girls in the class to 7 boys	4 to 7
4. 1/2 cup of cleaner to 1 gallon water	1/2 to 1
5. 2 parts sand to 1 part water	2 to 1
6. 3 yellow for every 2 red	3 to 2

Worksheet A5

Give a ratio for each rate.

1. 7 days per week
2. 2 for the price of 1
3. 1 cup for every 2 gallons
4. 2 bags of cement to 5 bags of sand
5. 7 bricks to 3 cinder blocks
6. 1 quart for every $\frac{1}{4}$ cup
7. girls to boys in your class
8. boys to girls in your class
9. students to teachers in your class
10. teachers to students in your class

ANSWER KEY:

1. 7 to 1
2. 2 to 1
3. 1 to 2
4. 2 to 5
5. 7 to 3
6. 1 to $\frac{1}{4}$
7. answers will vary
8. answers will vary
9. answers will vary
10. answers will vary

Worksheet B3

Write each as a ratio.

1. 3 to 7
2. 6 to 8
3. 9 to 4
4. 10 to 2
5. 31 to 49
6. 1 to 12
7. 6 yellow for every 2 blue
8. 4 bags of cement to 7 bags of sand
9. 3 parts sand to 1 part water
10. 1 cup cleaner to 4 gallons water

ANSWER KEY:

- | | |
|----------------------------|--------------------------|
| 1. $\frac{3}{7}$; 3:7 | 6. $\frac{1}{12}$; 1:12 |
| 2. $\frac{6}{8}$; 6:8 | 7. $\frac{6}{2}$; 6:2 |
| 3. $\frac{9}{4}$; 9:4 | 8. $\frac{4}{7}$; 4:7 |
| 4. $\frac{10}{2}$; 10:2 | 9. $\frac{3}{1}$; 3:1 |
| 5. $\frac{31}{49}$; 31:49 | 10. $\frac{1}{4}$; 1:4 |

Worksheet C2

Complete each table of equivalent ratios.

1. 2 cupcakes for .15

cupcakes	2	4	6	8	10
cents	15	30	45	60	75
ratio	2/15				

2. 4 blue to 2 green

blue	4	8	12	16	20	24
green	2	4	6	8	10	12
ratio	4/2					

3. 6 points per touchdown

points	6	12	18	24	30	36	42
touchdown	1	2	3	4	5	6	7
ratio	6/1						

Worksheet C3

A fertilizer calls for 2 cups of water for each 3 cups of fertilizer. Suppose you use 8 cups of water. How much fertilizer should you use?

Cups of water

2	8
3	?

Cups of fertilizer

Think: $? \times 2 = 8$

multiply 3 by the same number, 4.

Use 12 cups of fertilizer.

Worksheet C4

The company makes 12 new parts every 30 minutes. How many new parts do they make in 5 minutes?

Divide to find equivalent ratios.

	$\frac{12 \div 1}{30 \div 1}$	$\frac{12 \div 2}{30 \div 2}$	$\frac{12 \div 3}{30 \div 3}$	$\frac{12 \div 6}{30 \div 6}$
$\frac{\text{parts}}{\text{minutes}}$	$\frac{12}{30}$	$\frac{6}{15}$	$\frac{4}{10}$	$\frac{2}{5}$

This method is similar to reducing fractions. When the ratio 12/30 is reduced down to lowest terms it becomes 2/5. You are looking for the largest number that will go into both 12 and 30 evenly.

Worksheet C5

Solve the problems.

1. Doughnuts cost .15 for 2. How much will 4 doughnuts and 8 doughnuts cost?
2. You spent .75 for 5 pens. What did each pen cost?
3. Jim delivers 4 daily papers for every 3 Sunday papers. If he delivers 8 daily papers, how many Sunday papers did he deliver?

Complete.

$$1. \frac{3}{4} = \frac{?}{16}$$

$$2. \frac{2}{5} = \frac{6}{?}$$

$$3. \frac{4}{9} = \frac{8}{?}$$

$$4. \frac{5}{5} = \frac{35}{?}$$

$$5. \frac{7}{10} = \frac{?}{60}$$

$$6. \frac{10}{11} = \frac{?}{33}$$

Complete.

$$1. \frac{24}{40} = \frac{3}{?}$$

$$2. \frac{10}{16} = \frac{5}{?}$$

$$3. \frac{28}{32} = \frac{7}{?}$$

$$4. \frac{6}{24} = \frac{?}{4}$$

$$5. \frac{4}{8} = \frac{?}{2}$$

$$6. \frac{6}{9} = \frac{?}{3}$$

ANSWER KEY:

1. .30, .60
2. .15
3. 6

1. 12
2. 9
3. 18
4. 35
5. 42
6. 30

1. 5
2. 8
3. 8
4. 1
5. 1
6. 2

Worksheet D1

Find the equivalent ratios.

1.

cans of pesticides	1	2	3	4
cans of water	3			
ratio	1/3			

2.

peat moss	2	4	6	8	10
dirt	3/4				
ratio	2/ 3/4				

3.

dirt	1	2	3	5	6
sand	2				
ratio	1/2				

Worksheet D1
ANSWER KEY

1.

cans of pesticides	1	2	3	4
cans of water	3	6	9	12
ratio	$1/3$	$2/6$	$3/9$	$4/12$

2.

peat moss	2	4	6	8	10
dirt	$3/4$	$6/4$ or $1\ 1/2$	$9/4$ or $2\ 1/4$	$12/4$ or 3	$15/4$ or $3\ 3/4$
ratio	$2/3/4$	$4/1/2$	$6/9/4$	$8/3$	$10/15/4$

3.

dirt	1	3	4	5	6
sand	2	6	8	10	12
ratio	$1/2$	$3/6$	$4/8$	$5/10$	$6/12$

Worksheet D2

Solve the problems.

1. A nursery worker mixes 2 bags of dirt with 5 bags of sand. Suppose 8 bags of dirt are used. How many bags of sand are needed?
2. A recipe calls for 2 cups milk for each 3 cups of batter mix. Suppose you use 9 cups of mix. How much milk should you use?
3. The juice drink calls for 3 scoops per glass of water. Suppose you want to make 3 glasses. How many scoops do you need?
4. The pesticide mix says to mix $\frac{1}{4}$ cup to a gallon of water. Suppose you need 5 gallons of the pesticide mix. How many cups do you need?
5. The brick mason needs to replace 3 new bricks to every 5 old bricks. There are 15 new bricks. How many old bricks are there?

ANSWER KEY:

1. 20
2. 6
3. 9
4. $1 \frac{1}{4}$
5. 25

Worksheet D3

Solve the problems.

1. The recipe calls for 6 cups of flour to make 12 dozen or 96 cookies. You only want to make 2 dozen or 24 cookies. How much flour do you need?

2. The nursery worker has 10 bags of dirt and 25 bags of sand. He only needs to use 2 bags of dirt. How many bags of sand will he need?

3. The pesticide mix says to add 2 cups to every gallon (4 quarts) of water. You have a small job to do and only need 1 quart of water. How much pesticide mix do you put in?

4. The brick mason has 5 bags of cement. He has a five gallon bucket of water. He is only going to use 2 bags of cement. How many gallons water does he need?

5. The ratio of bricks to cinder blocks is 35/15. There are 7 bricks. How many cinder blocks are needed?

ANSWER KEY:

1. 1 cup
2. 5 bags
3. 1/2 cup
4. 2 gallons
5. 3 cinder blocks

INSTRUCTIONAL MODULE

VOCATIONAL AREA:
Agribusiness

ACCESS SKILL: DEMONSTRATE THE ABILITY TO COMMUNICATE
EFFECTIVELY WITH EMPLOYERS, CO-WORKERS
AND THE PUBLIC

TASK ANALYSIS STEPS: A-H

ACTIVITY	MATERIALS/RESOURCES
TASK A: Student will identify basic elements of good business communication.	
1. Teacher activity: Teacher defines good business communication as "the art of sending or receiving business messages that are understood." Teacher explains that ideas are sent in a variety of ways. Examples: <u>Speaking</u>: "Peter, please close the door." <u>Writing</u>: A postcard telling you about your friend's vacation, a work order form telling the carpenter what to do, a menu telling the customer what food is available, a "No Smoking" sign, an ad in the newspaper. <u>Non-verbal</u>: Teacher asks class to tell what he/she is trying to communicate: Teacher motions for a student to stand up; teacher uses facial expression and body language to show anger; teacher points out that students are sending non-verbal messages right now. "John looks bored," "Susan looks tired," etc. Student activity: Divide students into pairs. Have students try as many different ways as possible to send the same message.	
2. Teacher activity: Teacher points out that we receive messages in a variety of ways. We hear spoken messages, read written messages, and observe non-verbal (body language) messages. Have students explain how they received the messages sent to them in the previous activity. Student activity: Ask students to identify the senders and receivers in the messages on Worksheet A2, "Identifying Message Senders and Receivers."	Worksheet A2
3. Teacher points out that it is not enough to send and receive messages. Messages must also be understood. Teacher gives example of not understanding by saying something to the class in a foreign language (or gibberish). Was the message sent? (yes) Received? (yes) Understood? (no) Communication that is not understood is not effective. Have a discussion with students about why messages are frequently sent and received, but not understood (i.e. differences in meanings of words, unfamiliar slang, incomplete information, assuming someone remembers or has experienced something when he/she hasn't.).	
TASK B: Student will state why good communication is necessary on the job.	
1. Teacher has students brainstorm for reasons why communication is important on the job. Teacher asks students to imagine what school would be like if nobody communicated at all. What problems would result? Would the work get done? Also imagine what a restaurant, hospital or department store would be like without communication.	

ACTIVITY	MATERIALS/RESOURCES
TASK B: CONTINUED 2. Given a written work order or order from customers in a restaurant, students discuss the importance of written communication.	
TASK C: Student will identify and demonstrate appropriate non-verbal communication in a work situation. 1. Teacher points out that we are always communicating. Even when we don't use words, we are saying things non-verbally. Over half of our communicating is usually done without words. Teacher points out that students are non-verbally communicating with him/her now. For example: John looks tired, as he's lying with his head on his desk. Susan looks interested, as she is leaning toward me slightly and has frequent eye contact. Teacher asks students to show an emotion to a partner without using words. Partner guesses the emotion. Teacher asks what made him/her guess that emotion. Teacher points out that we communicate with our: - facial expressions - eye contact (or lack of it) - body posture - gestures - physical closeness/distance from someone Teacher gives examples of each of these and asks students to guess what he/she's communicating. 2. Teacher has students do activity sheet on "Communicating Non-verbally." Answers may be different, as there is more than one possible meaning. Teacher points out that one non-verbal behavior may have different meanings. The meaning is not always <u>understood</u> by others. Teacher points out that in most situations our body language is what people respond to and believe. Some psychologists say "Body language does not lie." If the message we say in words is different than what our body language says, people believe the body language. For example: A boy tells the store detective that he did not steal a model plane. All the time he is talking the boy looks down at the floor instead of looking the detective in the eye. Will the detective believe the boy? Why not? In good communication, body language must match the message. Have students role play situations where body language doesn't match. For example: Susan tells her boyfriend John, "I'm so mad at you," but she has a sweet smile on her face. Will John believe that she is mad? 3. Role play and discuss problems/constructive criticism with the boss at work.	Worksheet C2
TASK D: Student will be able to demonstrate good listening behaviors. 1. Teacher defines elements of good listening and discusses why they are important. Elements of good listening are:	

ACTIVITY	MATERIALS/RESOURCES																								
TASK D: CONTINUED maintain eye contact don't interrupt acknowledge message by responding to speaker verbally or non-verbally have appropriate posture and manners (don't yawn, burp, slouch) maintain appropriate physical distance from speaker observe speaker's non-verbal communication Have students use checklist to rate partner's listening behavior during class. 2. Discuss with students the importance of checking their listening. Role play situations such as taking a customers order and what to do if you are not sure you got it right. (Repeat order and ask if it is correct or ask the customer to repeat.)																									
TASK E: Student will demonstrate good speaking behavior. 1. Teacher defines elements of good speaking behavior and gives examples: eye contact clear speech appropriate tone of voice for the situation appropriate volume appropriate physical distance verbal and non-verbal messages match good posture Have students use checklist to evaluate teacher's speaking behaviors. Have students each stand up and tell where they work and what their job duties are (or tell their three favorite hobbies, etc.). Other students rate them on speaking using the checklist.																									
TASK F: Student will realize that there are different levels of communication on the job. 1. Teacher writes on the board the different levels of communi- cation on the job. boss customer (patient, student) employee employee Teacher has students identify the different levels in dif- ferent work situations. <table> <tr> <th><u>Work Place</u></th> <th><u>Employee</u></th> <th><u>Supervisor</u></th> <th><u>Customer</u></th> </tr> <tr> <td>school</td> <td>teacher</td> <td>principal</td> <td>students</td> </tr> <tr> <td>hospital</td> <td>nurse's aid</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>gas station</td> <td>attendant</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>department store</td> <td>sales clerk</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>restaurant</td> <td>waiter/waitress</td> <td>_____</td> <td>_____</td> </tr> </table>		<u>Work Place</u>	<u>Employee</u>	<u>Supervisor</u>	<u>Customer</u>	school	teacher	principal	students	hospital	nurse's aid	_____	_____	gas station	attendant	_____	_____	department store	sales clerk	_____	_____	restaurant	waiter/waitress	_____	_____
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Worksheet D1

ACTIVITY	MATERIALS/RESOURCES																								
TASK G: Student will realize that different levels of communication, and different work situations, have different rules and formalities. Students will realize that they need to listen and observe in order to figure out what is appropriate communication on a particular job.																									
1. Teacher points out that different work places have different ways of addressing the supervisor, customers and co-workers. Teacher asks students how they think one should probably address each of these in the following work places:																									
<table><tr><th>Work Place</th><th>Co-workers</th><th>Supervisor</th><th>Customer</th></tr><tr><td>hospital</td><td></td><td></td><td></td></tr><tr><td>school</td><td></td><td></td><td></td></tr><tr><td>gas station</td><td></td><td></td><td></td></tr><tr><td>department store</td><td></td><td></td><td></td></tr><tr><td>restaurant</td><td></td><td></td><td></td></tr></table>	Work Place	Co-workers	Supervisor	Customer	hospital				school				gas station				department store				restaurant				
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Under the heading of co-worker in a hospital the student may answer that they would address a fellow nurse's aid by their first name. A supervisor should be addressed by titles such as Mr., Mrs., Dr., etc. Customers (or patients) should be addressed as instructed by the supervisor.																									
2. Also, if students have jobs, have them discuss how they address co-workers, supervisors, and customers. Discuss the differences. Reinforce the idea that one needs to listen and observe to figure out what is correct.																									
3. Read the following situations to the students. Tell them that they are to imagine that they are a new employee that has just arrived for the first day on the job. Ask them to determine what to call the supervisor or customer in each situation.																									
a. You have been hired as a dietary aide delivering meals to patients. When you get to work, a co-worker says: "Our supervisor, Mrs. Jones, said for you to come to her office." What should you call the supervisor?																									
b. You have been hired as a service station attendant at a gas station. When you get to work you ask where to find the manager. Another employee says, "You can find Joe Brown in his office behind the shop." What should you call your supervisor?																									
c. You have been hired at a nice dress shop to keep track of the clothing customers try on in the dressing rooms. The sales clerk, Mary Gray, is older than your mother. What should you call her?																									
d. You are a receptionist at a dentist's office. An elderly gentleman, Peter Jones, is waiting to see the dentist. On his chart he is always referred to as Mr. Jones. You go to tell him it is his turn to see the dentist. How do you address him?																									
e. You are hired as a brick layer on a large construction job. When you get there, you ask another worker for the boss. He says, "Jack is over in that trailer." You walk into the trailer and ask to see him. The secretary says, "Have a seat. Mr. Smith will be out in a moment." What should you call the boss?																									

ACTIVITY	MATERIALS/RESOURCES																														
TASK H: Student will role play effective communication with customers, co-workers, and supervisors.																															
1. Discuss some "do's" and "don'ts" in getting along with customers, co-workers, and supervisors. Write the do's and don'ts on the board. Let students role play the following situations wrong, then write a script on how to do it right. Videotape them in both situations. <u>Communicating with Customers</u> <table> <tr> <th><u>DO</u></th><th><u>DON'T</u></th></tr> <tr> <td>Greet customer with a friendly smile. Look friendly and alive.</td><td>Be rude.</td></tr> <tr> <td>Be polite and courteous.</td><td></td></tr> <tr> <td>Try and help customer get what he/she needs.</td><td>Ignore the customer</td></tr> <tr> <td>Use good English.</td><td>Use slang or swear words. Say "yes", not "yeah".</td></tr> <tr> <td>Thank the customer. Say goodbye.</td><td></td></tr> </table> Do customer role plays. Use speaking and listening evaluations sheet as well as the above criteria to evaluate role plays. <u>Communicating with Co-Workers</u> <table> <tr> <th><u>DO</u></th><th><u>DON'T</u></th></tr> <tr> <td>Be friendly. Greet co-workers with a smile.</td><td>Put others down.</td></tr> <tr> <td>Call co-workers by name.</td><td>Gossip.</td></tr> <tr> <td>Accept criticism. Use it to improve your job performance.</td><td>Be bossy.</td></tr> <tr> <td>Help co-workers.</td><td>Blame others for your mistakes.</td></tr> <tr> <td>Ask for help when you need it.</td><td></td></tr> </table> Do role plays on communicating with co-workers. To evaluate, have students use speaking/listening worksheet, and the do's and don'ts on the board. <u>Communicating Effectively with the Supervisors</u> <table> <tr> <th><u>DO</u></th><th><u>DON'T</u></th></tr> <tr> <td>Greet supervisor politely. Address supervisor correctly.</td><td>Call supervisor by first name unless he/she has instructed you to or other employees do.</td></tr> <tr> <td>Accept orders graciously. Be sure you understand instructions correctly. Ask questions if needed.</td><td></td></tr> </table>	<u>DO</u>	<u>DON'T</u>	Greet customer with a friendly smile. Look friendly and alive.	Be rude.	Be polite and courteous.		Try and help customer get what he/she needs.	Ignore the customer	Use good English.	Use slang or swear words. Say "yes", not "yeah".	Thank the customer. Say goodbye.		<u>DO</u>	<u>DON'T</u>	Be friendly. Greet co-workers with a smile.	Put others down.	Call co-workers by name.	Gossip.	Accept criticism. Use it to improve your job performance.	Be bossy.	Help co-workers.	Blame others for your mistakes.	Ask for help when you need it.		<u>DO</u>	<u>DON'T</u>	Greet supervisor politely. Address supervisor correctly.	Call supervisor by first name unless he/she has instructed you to or other employees do.	Accept orders graciously. Be sure you understand instructions correctly. Ask questions if needed.		Worksheet H1a Worksheet H1b
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Worksheet A2

Identifying Message Senders and Receivers

In effective business communication there is always a sender, a receiver, and a message that is understood. Read the examples below and identify the sender and the receiver.

Example: The boss shakes hands with a new employee, John, and says, "Welcome, John. I hope you will enjoy your work here."

Sender: Boss Receiver: John

1. A customer drives into the gas station and says to the attendant, "Fill it up with unleaded gas, please."

Sender: _____ Receiver: _____

2. The service station attendant says to the customer, "That will be \$10.83, ma'am."

Sender: _____ Receiver: _____

3. There is a sign on the restaurant door that says, "No shirt, no shoes, no service. The Management."

Sender: _____ Receiver: _____

4. Cindy is a nurse's aide at a nursing home for elderly people. She brings Mrs. Jones her dinner. When Cindy tries to feed Mrs. Jones a fork full of liver, Mrs. Jones shuts her mouth and refuses to open it.

Sender: _____ Receiver: _____

5. A customer at a restaurant reads a menu to see what the daily special is.

Sender: _____ Receiver: _____

6. Mr. Smith calls the florist and asks that a dozen roses be sent to his wife.

Sender: _____ Receiver: _____

7. A carpenter reads a work order from the maintenance supervisor telling him to repair a stairway.

Sender: _____ Receiver: _____

8. Golde's department store sends postcards to customers telling them about a dress sale.

Sender: _____ Receiver: _____

Worksheet C2

Communicating Non-Verbally at Work

1. You work in a restaurant. You are training a new worker to clean the milk machine. As you explain things, you notice that the new worker is frowning. The frown probably means that _____.
2. John is waiting to be interviewed for a job. He keeps fidgeting with the pencil and drumming his fingers on the arm of his chair. John is probably _____.
3. Your boss tells you that you are getting a promotion and raise in your pay. Your boss then shakes your hand. The handshake says that your boss _____.
4. A co-worker asks you to work a Saturday night shift for him/her. You have worked this shift for him/her three times already. When you asked him/her to work for you last week, he/she said no. When he/she asks you to work for him/her next Saturday night, you just turn and walk away. You are letting him/her know that _____.
5. Your boss is frowning and shaking a finger at a young person that is walking out of the store. These gestures show that your boss is probably _____.
6. You walk into the office and smile and nod your head at each of your co-workers as you pass their desk. You are showing your co-workers _____.
7. You notice that your lunch has been taken again. You walk up to the co-worker who you think took it. You stand toe to toe, glaring at him/her. Your posture is stiff and tense. You are _____.
8. Jane is a new sales clerk in the jewelry department. When a customer asks her where something is. Jane points to it, but never looks the customer in the eye. Jane is probably _____.

Worksheet D1

Speaking and Listening
Evaluation Worksheet

Mark an "S" for satisfactory or an "I" for needs improvement.

SPEAKING

Maintained good eye contact

Spoke clearly

Used appropriate tone of voice

Used appropriate volume

Stood at appropriate physical distance

Verbal and non-verbal messages matched

Had good posture

LISTENING

Maintained good eye contact

Did not interrupt

Paid attention

Responded verbally or non-verbally

Maintained appropriate physical
distance from speaker

Worksheet H1a

ROLE PLAYS

To use role plays, teacher asks (or appoints) students to volunteer for the employee and other roles. Teacher then gives the role play slips to each student. Other students rate role players, using the speaking/listening evaluation (worksheet B1) and the criteria written on the board.

Communicating with Customers Role Plays

Employee: Cashier at a grocery store. You are checking out a customer's groceries. The total bill is \$56.98.

Customer: You open your checkbook to write a check to pay for your groceries. You discover you are all out of checks. You only have \$3.98 in cash.

Employee: Waiter/Waitress in a restaurant. You take a man's order. You forgot to ask him how he wants his steak done and what kind of dressing he wants on his salad.

Customer: You are in a hurry. Act impatient with the waiter/waitress.

Employee: Salesclerk in a jewelry shop. Several young kids come in to look at watches and jewelry.

Customers: (need two or three) You are kids who want to try to shop-lift a watch. Two of you try to distract the salesclerk while the third person takes the watch.

Employee: Waiter/Waitress. You serve soup to a customer.

Customer: When you taste your soup it is cold. You want the waiter/waitress to bring your soup hot.

Employee: Nurse's aide in a hospital.

Patient: Your back really hurts from sitting in the same position. You call the nurse's aide and ask him/her to adjust your pillows.

Employee: Stock clerk at a grocery store.

Customer: You want to buy some bagels, but you can't find them. You ask the clerk for assistance.

Worksheet H1a (continued)

Communicating with Customers Role Plays

Employee: Food service short order cook

Customer: You ordered your eggs sunny side up and soft, but the waiter/waitress brought them to you hard. You can't find your waiter/waitress, so you take your eggs to the cook's counter and demand to have some eggs cooked the way you asked.

Employee: Auto mechanic

Customer: You just had your radiator fixed at the cost of \$120 two days ago. Now your radiator is overheating again. You are angry because you think the mechanics did not fix it correctly. You take it back to the repair shop and ask to see the mechanic that fixed it.

Employee: Nurse's aide in a hospital

Patient: You are being operated on tomorrow. You are feeling lonely and scared. You call the nurse's aide and ask for a drink of water, but what you really want is to talk. You are afraid you might die tomorrow during the operation.

Employee: Clerk in a shoe store

Customer: You want to buy a pair of good tennis shoes to go out for track, but you are not sure what kind to buy.

Worksheet H1b

Communicating with Co-workers Role Plays

Employee #1

You are a bookkeeper at a bank. Thank the bank teller you work with for giving you the information you needed to solve some bookkeeping problems.

Employee #2

You are a teller in a bank. Respond to what Employee #1, a bookkeeper, tells you.

Employee #1

You are a salesclerk in a shoe store. Another salesclerk spends a lot of time talking to you about his/her personal problems. This interferes with your waiting on customers. You decide to ask him/her not to talk to you about these problems while you are working.

Employee #2

You are a salesclerk in a shoe store. Respond to what Employee #1, another salesclerk, says.

Employee #1

You are a cook in a restaurant. You have a really hard time reading one of the waiter/waitresses' orders. You ask him/her to write more plainly.

Employee #2

You are a waiter/waitress in a restaurant. Respond to what Employee #1, a cook, says to you.

Employee #1

You are a stock clerk in a grocery store. A large order of canned vegetables came in. The boss asked you and another employee to hurry and set up a display before the store opens. The other employee is working very slowly and talking about the ballgame he/she went to last week. You want him/her to speed up.

Employee #2

You are a stock clerk in a grocery store. You are helping another employee set up a display of vegetables. You are talking about a ballgame you went to last week.

Worksheet H1b (continued)

Communicating with Co-workers Role Plays

Employee #1

You are a plumber putting a sink into a new house. You need help to lift the sink into a cabinet.

Employee #2

You are a construction worker building a new house. Respond to the plumber's request.

Employee #1

You work on an assembly line in a factory. You are new on the job. You cannot figure out how to get one of the machines that punches holes in metal to work.

Employee #2

You are an experienced employee on an assembly line in a factory. Respond to Employee #1.

Employee #1

You work in an office. At break time you are having coffee with other employees who are discussing the new supervisor. What do you do?

Employees #2, 3, and 4

You all work in an office. You just got a new supervisor. You are trading gossip about her.

Employee #1

You work at a store. You and another employee are responsible for getting the store ready to open up. The other employee always arrives late which leaves all the work to you. Talk to him/her about it.

Employee #2

You work at a store. You are supposed to arrive early to get the store ready to open. You are always late.

Worksheet H1c

Communicating with Supervisors Role Plays

Employee: You work in a paint store. You have just finished unpacking a large order of paint and stacking the cans in a display.

Supervisor: You tell the employee that the large order of paint he/she has just unloaded and stacked is in the wrong place. Tell him/her that he/she will need to move them.

Employee: You are a sacker in a grocery store. You just finished sacking 10 bags of groceries for a very pushy customer.

Supervisor: A customer comes and complains that his/her grocery bags broke because the sacker did not double bag them as he/she requested. You talk to the sacker about this.

Employee: You work in a cafeteria where you need to time in and out on a time clock. You often forget to clock out.

Supervisor: An employee you supervise at the cafeteria frequently forgets to clock out. Talk to the employee about this.

Employee: You like to talk on the phone a lot to your friends and family. Sometimes you do this during working hours.

Supervisor: You need to tell the employee not to talk on the phone except during break times. He/she has been making too many personal phone calls during working hours.

Employee: Your supervisor has been asking you for two days to file some work orders which you keep putting off doing.

Supervisor: You have been asking the employee to file some work orders for two days. This employee frequently puts off doing jobs he/she does not like. Talk to the employee about this.

Worksheet H1c (continued)

Communicating with Supervisors Role Plays

Employee: You work in a dress shop. Your supervisor has told you to thank customers and tell them you hope they will shop here again. You ring up a sale and tell the customer thanks.

Supervisor: You have instructed salesclerks in you dress shop to ring up a sale, thank customers, and ask them to come again. This salesclerk rings up a sale and only says thanks.

Employee: You are an orderly/nurse's aide in a hospital. White shoes are part of your uniform. You wear them but never polish them.

Supervisor: This orderly/nurse's aide never polishes his/her white shoes which are part of the uniform. Also you notice that he/she seldom smiles at patients or makes small talk with them. Talk to him/her about this.

Employee: You are a waiter/waitress in a busy restaurant. Your boss is telling you to clean the milk machine, but you have lots of customers still waiting to order. You do not have time to clean the machine.

Supervisor: Ask the waiter/waitress to clean the milk machine now.

INSTRUCTIONAL MODULE

ACCESS SKILL: DEMONSTRATE GROSS MOTOR SKILLS

VOCATIONAL AREA:
Horticulture
Landscaping

TASK ANALYSIS STEPS: A-F

ACTIVITY	MATERIALS/RESOURCES
TASK A: The student will bend, reach, stoop, push, and pull appropriately without assistance	
1. Introduce the lesson to the students by telling them how important it is to move the body in the safest and best manner. Ask students to demonstrate how they would pick up a box on the floor, push a heavy object (such as a refrigerator), lift a heavy object (such as a television, etc.).	
2. After the students have shown their way of lifting, stooping, pushing, pulling, and bending, demonstrate the appropriate way through miming these methods. (act out the wrong way and then the right way. Do it in silence - possibly even in a dark room with a bright light on you. Better yet, have a mime come in to your classroom to demonstrate for you.).	Guest mime
3. Put out some large objects in your room and show the students the proper ways of lifting, moving, or rearranging the objects. For instance, lift a chair the proper way - demonstrate the proper method of bending at the knees and keeping the back straight and then lifting--using the arms. Or, ask the students to push the file cabinet and point out that when you get a really heavy object such as a file cabinet you should plan ahead and ask someone to help you.	Things to lift: desk, chair, file cabinet, large boxes (empty and full) people, small objects off the floor, light weight and heavy objects up high on a shelf
4. Use Worksheet A4 to demonstrate to the students the proper methods of lifting.	Worksheet A4
5. Show the students the film: "A New Way to Lift" which demonstrates the proper methods of lifting and the results of improper lifting. (8 minute film)	"A New Way to Lift" available from the Academic Support Center, UMC
6. Invite a guest speaker into the classroom to discuss the proper methods of lifting and why it is done that way. Physical therapists are doing more and more of this type of activity and might even consider putting on an evening program for the school or the class and their parents.	Guest speaker: Physical Therapist
7. One at a time, ask the students to demonstrate the proper methods they have learned. Review this lesson often to make it become a healthy habit.	
TASK B: The student will lift up to and including 50 pounds of weight	
1. After learning how to lift, it is important to gradually learn how much you can lift. Before doing this portion of the unit, make sure students have no physical problem which would keep them from being able to lift 50 pounds.	

ACTIVITY	MATERIALS/RESOURCES
TASK B: CONTINUED	
2. Introduce the lesson to the students by asking them what kinds of workers in their area of vocational choice might have to lift 50 pounds. After you have named a few, ask the students why they think it would be important to learn to lift up to 50 pounds. Students should recognize that workers in horticulture, auto service, building trades, etc. have to lift heavy objects in order to do their job. There is not always a machine or someone else to do the job. Somewhere along the line, you are going to be that "somebody else". 3. Test the students' strength by handing each student a 5 pound sack of flour, sugar, or sand. Ask the students to lift the 5 pound bag as high as he/she can comfortably and time him/her to see how long he/she can hold that bag. Gradually increase the time the bag can be held by each person. 4. Once the student can lift the 5 pound bag of flour with both the left hand and the right independently for 3 minutes, work up to the lifting of 10 pounds. Student will lift 10 pounds of weight with his/her dominant arm for up to 3 minutes. Check each student individually. 5. Fill a bag with 20 pounds of sand and demonstrate to each student the proper way of lifting 20 pounds using both arms to lift (see previous activity). Require each student to lift 20 pounds of weight and hold it to the count of 60. 6. Put 30 pounds of weight in a box and demonstrate the proper way of lifting. Each child should lift the 30 pound weight and put it back down slowly--without dropping it. Once the student has demonstrated the proper way to lift such a weight, ask him/her to lift the 30 pound weight 10 times without stopping. 7. Give the students some practical experiences lifting weight of 30, 40, and 50 pounds of weight by assigning him/her to plant a small tree (30-40 pounds - including dirt), or lifting other heavy objects around the classroom and home. 8. If your school has a weight room, make use of it. Ask the coach or one of the regular weight lifters to demonstrate the use of the weight lifting machines and provide an opportunity for students to work out on it daily or every other day. 9. Demonstrate the appropriate way to do chin-ups. Have the students try to do at least 5 chin-ups each day. 10. Invite a professional weight lifter or tai kwan do instructor to demonstrate their muscles and strength and talk about how they keep in shape.	5 pound bag of sand, flour, sugar, etc. 10 pound bag of sand, etc. Heavy items that might be used in vocational projects Weight room, guest demonstration Chin-up bar Guest speaker
TASK C: The student will lift up to 50 pounds of weight repeatedly for a prolonged period of time	
1. Once the student has developed the strength he/she needs to lift 50 pounds of weight, discuss the need to be able to lift 50 pounds of weight repeatedly. (Many jobs do not require that you just lift one thing, but probably many heavy things, and you must be strong enough to do so.)	

ACTIVITY	MATERIALS/RESOURCES
TASK C: CONTINUED	
- Using bar bells, arm weights, chin-ups, push-ups, and large boxes, require the students to lift up to 50 lbs. of weight 12 times per hour (once every 5 minutes). Check the student to be sure he/she is using proper body position and doesn't start to use his/her body improperly after a few lifts. - Encourage the student to lift heavy objects in the classroom whenever heavy things need to be lifted. Make sure the student is using the best possible methods to lift.	Bar bells, large heavy boxes, small heavy boxes, buckets of paint or water, bails of hay, etc.
TASK D: The student will demonstrate agility	
- Introduce the lesson by telling the students that they are going to work on becoming agile. Ask if anyone knows what agility is and why they need that ability. (Ability to move with ease and quickness is needed by everyone in order to show interest, to adequately perform at work, to complete tasks, etc.) Discuss a person who moves very slowly and demonstrate. Then ask why that person might not get the job done. Then ask one of the students who is usually very slow or lacking in agility to demonstrate the opposite. Make sure he/she adequately demonstrates smooth, quick movements. - Discuss what would require agility in the vocational area for which they are preparing. - Show the many forms of agility and movement as a graceful form of expression by showing "Learning Through Movement," a 30 minute film. - Practice the skills learned in Tasks A-C and increase the speed with which the task is completed. Check speed with a stop-watch. - Using an aerobic record, demonstrate various moves in aerobics to the students and let them practice the moves until they have an idea of how to move their body upon command. Then turn on the music and begin moving. There are several records out on the market and your school library might have copies of various ones you'd like to use. (Be sure to practice the steps ahead of time). - Discuss how quick jerky movements may be fast and might get the job done, but might cause accident or injury. Moving objects around on a cart requires more than simple pushing. Also, it requires concentration and planning. For example: If we were to move a cart with a television set down the hallway and not look where we are going, we might hit a bump or run into someone and the TV would fall off - shattering! Practice moving empty boxes on a cart, then have light-weight non-breakable objects in the boxes. Later put heavy objects on the carts and assign the students to move them through the hallways quickly, but safely--telling ahead of time what they are going to do to insure safety of that item (such as holding onto the object just in case we do hit a bump, etc.). Contact the parents of the students and explain to them the lesson on agility. Ask that they watch their son or daughter at home and remind them to practice agility--to move quickly, smoothly, and gracefully.	"Learning Through Movement" is available from the Academic Support Center - UMC Stop-watch Aerobics record, cassette tapes or videos. Moving cart, dollie, boxes, light-weight non-breakable objects, heavy objects

ACTIVITY	MATERIALS/RESOURCES
TASK E: The student will demonstrate good eye-hand coordination 1. Explain and introduce the lesson on eye-hand coordination by timing the students' ability to screw and unscrew screws on a board. This requires skills other than eye-hand coordination, but also requires that skill and is a fun way to introduce the lesson. Or have the students put the correct pegs into holes as rapidly as possible. 2. Ask the students to be honest with themselves about how much trouble they had completing this task in a given period of time. This gives them some indication as to why they are working on this task. Discuss various reasons why eye-hand coordination is important and what jobs require such a skill. Impress upon the students the need to learn this skill. 3. Give each student a piece of cardboard with a simple shape on it. Assign the students to trace around the shape and then cut it out. Make sure the student can cut out the shape without any odd angles or frayed edges before moving on to a more difficult shape. Begin with circles, squares, and triangles and progress to tracing objects such as screwdriver, hammers, etc. and cutting them out. 4. Break the students into pairs and give each pair a 200 piece puzzle (fairly large pieces) and see who can finish first. The pair that finishes first gets to move on to putting together a 500 piece puzzle. Time students to see which group can finish first. Because this might take several days to complete and can become monotonous after a short period of time, allow approximately 20 minutes per day for this activity. 5. Drill 24 holes in a small board and give the student 24 nuts and bolts. Time the students performance on putting each nut and bolt in each hole and tightening. Eventually give the students a timer or stop watch and allow them to time themselves to cut down on the amount of time it takes to complete this task. 6. Practice writing skills and work toward forming the letters accurately. Accept only papers with accurately formed letters. Some students might benefit by using a pencil gripper - these are available for the student to purchase at the University Book Store. 7. Decide on a theme for improving eye-hand coordination and allow the students to develop a bulletin board display using some of their skills and showing improvement. Encourage them to trace from pictures, cut items, build small displays for the board, etc.	Screws in board, screwdriver, peg-board and golf tees or pegs Cardboard, pencils, scissors, screwdriver, hammer, etc. 200 and 500 piece puzzles, timer 6" x 6" board with 24 holes drilled in it, 24 nuts and bolts, timer or stop watch Pencil and paper Paper, pencils, scissors, hammer, nails, screwdriver, etc.
TASK F: The student will accurately determine left from right 1. When teaching left/right discrimination with the junior high/high school student, remember to keep the skills fairly interesting and limit the time. Work with the student on a daily basis for short periods of time to learn the skill with little frustration. Begin with simply telling the student that he/she is going to learn to tell left from right. Discuss the reasons why this would be necessary (to know which tire to change, which hand to use, which direction to turn, how to open a lock, where to turn a car, etc.).	

ACTIVITY	MATERIALS/RESOURCES
TASK F: CONTINUED	
Spend as much time as is needed in order for the student to correctly raise the hand called for 9 out of 10 times. For example: The teacher would say, "Raise your right hand." The student should immediately raise his right hand without hesitation. If there is any hesitation, you cannot count that time as accurate. Repeat until the student has raised the correct hand 9 out of 10 times.	
2. Once the student is able to do the above, ask him to pick up the items you name with the correct hand. For example: "Pick up the hammer with your right hand and the nail with your left." The student should do this correctly (even when you switch which hand is to pick up which item), 9 out of 10 times.	Hammer, nails, etc.
3. If the student is having trouble with any part of the activity stand him/her in front of a mirror and mark on the full-length mirror the shape of his body. Draw a line down the center of the shape and mark one side right and the other side left. Let the student stand in front of the table until he/she is able to do the tasks without hesitation.	Magic marker, full-length mirror
4. Place 2 items in front of the student (a pot and some soil, a hammer and some nails, a screwdriver and some screws, a pencil and some paper, etc.) Ask the student to pick up one item with one hand and the other item with the other. The student should at this point tell <u>as</u> he picks up the item which hand he/she is using. There should be no hesitation in the accuracy in 9 out of 10 times.	Flower pot, soil, screws, screwdriver, hammer, nails, pencil, paper, etc.
5. If the student is having trouble at this point you might try outlining the student's body on the chalkboard and labeling one side left and one side right. Tell the student that he is facing you, so which side would be the right side of his body and which would be the left. If he is standing with his back to you, he should be able to quickly tell which is left and which is right.	Chalkboard, chalk
6. Plan a project (a design of a garden, a model house made of cardboard, etc.). Write directions as to where the student should place certain items in his project. For example: to the right of the radishes you should plant the lettuce; to the left of the kitchen should be the bathroom; put the couch against the front wall of the living room on the right side, etc.	Materials needed will vary according to the project selected
7. Using game pieces from Monopoly, place the houses on a make-believe town that you and the students have drawn on cardboard. Give the students assignments as to where to place the houses. Later have each student tell you where he/she placed certain houses on that game board.	Poster board, Monopoly game pieces

Worksheet A4

1. Size up the load to be lifted. Do not even attempt to lift a large load alone. If you have any doubt about your ability to lift an object, ask for assistance.
2. Make sure you are well-balanced. Your feet should be apart to give you a broad base of support if you are lifting a heavy object or person.
3. Move close to what you are to lift. Do not reach for any object that is up high or over far. Get your body close to the object to be lifted. If it up high, get on a ladder. (Use the proper method of climbing a ladder. See the Safety Module.)
4. Keep your back straight. Line up your back so you don't strain it. Bend at the knees and hips--NOT the back.
5. As you lift, straighten your legs. When you bend to lift something, bend your knees. To lift it, straighten your legs.
6. If you need to turn, shift the position of your feet, but do NOT turn your body. Twisting injures muscles.
7. If you are lifting with someone, lift smoothly. This avoids strain on your back which you would get from jerky movements. Count with the person to make sure the lift is smooth.
8. Push or pull a heavy object whenever possible. It is easier and safer.
9. Remember to use these skills all of the time to keep yourself safe.

INSTRUCTIONAL MODULE

ACCESS SKILL: DEMONSTRATE SAFETY PROCEDURES FOR VARIOUS ACTIVITIES

TASK ANALYSIS STEPS: A-J

VOCATIONAL AREAS:
All Agriculture
Areas

ACTIVITY	MATERIALS/RESOURCES
TASK A: Student will identify and define "safety" and "emergency". 1. The teacher directs the lesson on safety by asking if the students understands "safety." If taught in a group, the students could break into small groups to define safety and give an example of it. Explain to the students that they are responsible for their own safety and that is why they are to learn about it in this lesson. 2. Ask some "What if" questions. For example: What if you were told to climb a ladder and you didn't know how to set it up, what would you do? What if you were to cut up a salad where you work and you had never worked with a knife before, what would you do? These are things the students will learn in this lesson. 3. Define "safety" as the state of being safe. Explain it to the students further by saying that it is when you are not in danger, you are safe. Write "safety" on the board. 4. Define "emergency" as a sudden important happening or accident. Ask the students if they know what emergency means and ask them to give an example of an emergency. Make sure each student understands both definitions before moving on. Write "emergency" on the board. 5. Individually ask each student to identify "safety" and "emergency." 6. You might also want to add to the students definition the word "accident" and define it. Explain to the students that more than half of the accidents occur in the home--a place we would consider safest.	Chalk, chalkboard Chalk, chalkboard
TASK B: Student will discuss safety procedures of which he/she is presently aware. 1. Explain to the students that the purpose of this lesson is to see how many safety procedures he/she is currently aware of. 2. Ask students to write about, tell about, or role play with another student a safety procedure he/she is aware of. For example: When climbing do not stand on a chair, but use a ladder. Do not keep matches over a stove. Do not put your hand or other objects on a hot stove or in hot water, etc. 3. Once students have exhausted their knowledge of safety procedures, identify other areas such as proper ways to lift, bend, push, pull, cut with a knife, use power tools, use hand tools, properly erect a step ladder and climb, read and understand safety instructions. 4. Invite guest speakers to demonstrate the proper methods of performing the above skills safely. Have the students report on each one if they are already aware of the safety precautions necessary.	Guest speakers Worksheet B4

ACTIVITY	MATERIALS/RESOURCES
TASK C: Student will identify various situations in which it is necessary to know the proper safety techniques.	
1. Introduce lesson by discussing with the students that it is important to know the proper safety techniques to use in various situations. Ask the students if they can identify some of these situations. (This might be a review for some students, but some may come up with some new ideas.) 2. Invite a guest speaker from the Fire Department, Health Department, First Aid or Red Cross Agency, or a safety administrator in a local business to speak to the group on safety precautions that are taken on the job and those the students must take on their own. 3. Give the students newspapers and magazines and ask them to identify various situations in which an accident could have been prevented if someone would have used the proper safety precautions. Have them cut out pictures or articles about an accident and tell the proper safety procedures which should have been used. 4. Discuss with students safety procedures we see each day, such as stop signs, traffic lights, one-way signs, etc. Sometimes in cafeterias we see signs which tell us that a microwave oven is in use. What difference does that make? Elicit from the students the purpose behind some of these common warnings that they might take for granted. 5. Assign the students a person to watch and report about. Tell the students to watch the person for at least ten minutes and see how many situations he/she used proper safety procedures in and how many he did not. They should also tell what the person was doing and how to remedy the situation if it needed to be remedied. For example, one student might be assigned to watch the school janitor after school to see what he/she does and then write a report on what he/she saw. 6. In talking about safety in various situations you might discuss job safety. What kinds of jobs are most dangerous and why? Students could be assigned a small research project regarding the amount of danger involved in the occupations in which they are interested. They could then discuss, write, or role play ways in which they could be safe should they decide to take that job. Don't forget to discuss small things like wearing gloves when cleaning ovens, walls etc., especially if they are working in a job which does a lot of cleaning.	Guest speaker Newspapers, magazines Pictures of signs
TASK D: Given various situations the student will become familiar with the safety procedures involved.	
1. Introduce the lesson by telling the students that they will become familiar with various safety procedures and actually demonstrate them during this portion of the lesson. 2. Begin with showing the students proper and improper techniques for lifting and moving objects. Explain that there are proper and improper ways to lift objects. After demonstrating the proper methods have each student do so. (Sometimes feeling the difference is necessary, therefore the demonstration of movement in each is necessary.) See examples on Worksheets D2 and D2a.	Worksheets D2, D2a

ACTIVITY	MATERIALS/RESOURCES
TASK E: CONTINUED 10. Visit a hospital emergency room and ask the emergency medical technicians to demonstrate moving an injured person by pulling the person, one-man lift, two-man lift, and six-man carry. They might also demonstrate fore-and-aft carry and how to carry someone using a blanket. 11. Discuss burns and the varying types (sun, chemical, water, electrical, etc.). Review the signs and symptoms for burns and what to do for them. (Keep the patient covered, comfortable, and moistened.) 12. Using the American Red Cross First Aid book review the procedures for giving CPR. If it is felt that this is necessary for your students ask one of the CPR instructors from the American Red Cross to do the training. CPR is a special procedure and requires specific training in order to teach it. 13. Assign the student(s) the task of calling Tel-Med in order to find out more about other first aid training. Require them to report to the class what they have learned. Be sure to check the students after each segment of the first aid training. *Note: Because first aid training could take a full year to teach, select the areas of training which best fit the needs of your student(s) and teach practical skills - symptoms and treatments.	Field trip to an emergency room CPR instructor
TASK F: Student will distinguish between types of knives and the safety procedures for using knives. 1. Discuss with the students the objective of this lesson - varieties of knives and how to use them safely. 2. Remind students that knives are not acceptable at school and ask if they know why. (Because they are dangerous.) 3. Ask students to identify various knives they are familiar with (pocket, kitchen, steak, dinner, slicing, paring, etc.). Ask the students if they are familiar with these and if they have ever used any of them. One at a time introduce the knives to the students and demonstrate the proper use of each. Remind students to always cut away from themselves so that if the knife should slip they would not be cut. (If you do not have access to each of these types of knives use the pictures on Worksheet F3 to show students examples.) 4. Show students not only how to use the knives, but also how to safely carry knives--carrying it by the handle with the blade down and the sharp edge facing behind them. Tell them to carry it out to the side, but not so far that they would hurt someone who might walk beside them. Have the students demonstrate this using a wooden or plastic knife until safe procedures are completely learned. 5. Using a paring knife demonstrate the proper way to cut food --on a cutting board, pressing down on the knife blade with one hand and firmly holding the handle with the other, remembering to keep all fingers and other body parts out of the way. Allow each student a chance to demonstrate the	Worksheet F3 Knives Paring knife, cutting board, vegetables

ACTIVITY	MATERIALS/RESOURCES
TASK F: CONTINUED safe procedure. Discuss with the students why we use a cutting board vs. our hand or the counter top. Remind students that a cutting board gives us a good solid surface, protects counters, and usually keeps objects from slipping as they might on a counter. We should never hold an object in our hand to cut, because we might cut our hand. 6. Demonstrate the safe way to open a pocket knife by laying it on its side on a flat surface and holding it down firmly with one hand. Gently open the blade to the first notch. Once it is opened that far you may turn it up or leave it as it is and open it the rest of the way. Remind students to always close the knife as soon as they are finished using it. Show them the proper way to close the knife. Once again place the knife on its side on a flat surface and firmly hold in place with one hand while closing the knife with the other hand.	Pocket knife
TASK G: Student will demonstrate the safety procedures for using power tools. 1. Introduce the lesson by pointing out to the students that safety is always their responsibility and accidents are always painful to the victim and to others around him/her. 2. Ask the students to name a few power tools they are familiar with (drill, electric saw, etc.). Ask them to tell the safety procedures they are familiar with in using these tools. 3. Invite the shop teacher in to talk to the students about shop safety--especially regarding power tools. If the shop teacher cannot make a guest appearance, perhaps a senior student who is very competent and is checked out by the shop teacher would like to demonstrate the safety procedures. 4. Use the rules on Worksheet G4 to reinforce the need for safety procedures when using power tools. 5. Ask the students to each think of another rule about using power tools and list them on the board. Then combine all of the lists together on one sheet. Assign the students to take the list home and ask their parents for other safety precautions that were possibly forgotten in the class. 6. Show the movie "Safety in the Shop: Basic Practices" which demonstrates safety in using both power and hand tools in both wood and metal shops. Ask students to discuss the rules they learned from the movie which they had overlooked in previous assignments. Add this list to the list made in Activity 5 and assign a group of students to make a special bulletin board with all of the rules displayed.	Guest speaker and shop tools Worksheet G4 Chalk, chalkboard "Safety in the Shop: Basic Practices"
TASK H: Student will recognize and identify hot surfaces and demonstrate ways to keep oneself and others safe from hot water and hot surfaces. 1. Introduce the lesson to the students by asking them to name some "hot" things they are familiar with which might burn them. Ask them to think of as many as possible. (They	

ACTIVITY	MATERIALS/RESOURCES
TASK H: CONTINUED	
might name stoves, ovens, furnaces, hot water pipes, fireplaces, cigarettes, metal exposed to sunshine, motorcycle and other exhaust pipes, etc.) - Discuss burns with the students and ask them to label some common causes of burns (carelessness with cigarettes or matches, scalds from hot liquids, use of strong chemicals, defective heating, cooking, electrical equipment, use of open fires, getting into overly hot bath water, etc.). Tell them that a burn is an injury which results from heat, chemical agents, or radiation (like from the sun), and it can cause serious illness, injury, or possible death. - Bring into the classroom some of the above mentioned causes of burns (those which are safe to show), or show pictures of some of these burn causing agents. Ask the students to determine the reason these things might cause burns and how the burns can be prevented. For example, show the students a drawing of someone getting into a tub of steamy hot bath water and getting burned. Ask the students how that could be prevented. They might need to get into small groups to be sure they do not leave out any possible prevention methods. For examples see Worksheet H3. - Show the film "Kitchen Safety: Preventing Fires" and discuss grease fires and cleaning stove hoods and duct systems to keep them safe. Also discuss fires in deep fat fryers, grills, trash cans, and electrical equipment. - Discuss with the students that sometimes a burner doesn't look hot, but it is. We must know ways of checking hot surfaces without burning ourselves. Ask how many students are familiar with "hot wires." Explain to the students that these wires may not be hot to the touch, but could electrocute or burn a person if handled in the wrong way. We must therefore learn to handle the wires safely. Follow up with the movie "Fire Prevention: In the Home" which discusses fires in electrical outlets, and other danger spots such as the attic and basement. - Cut several strips of paper and write various fire hazards on the paper. Ask each student to pantomime what they would do if they were injured in that way. Then ask another student to role play or tell ways that type of injury might be prevented. For example, a student might pull a slip of paper with the words "cigarette burn" written on it. The student would act out getting a cigarette burn--maybe by sitting in a chair and falling asleep with a make-believe cigarette in his/her hand. The other student would act out the part of prevention by simply putting out the cigarette before closing his/her eyes while sitting in the chair. - Invite someone from the Fire Department or a local restaurant to talk about fire safety and keeping oneself safe from burns or hot surfaces that could potentially burn. - Ask students to list as many incidents as they can possibly think of in which someone might get burned. Have the students take the paper home and check with their parents to see if their home is safe from these burn possibilities.	Materials which show possible burn agents, pictures of burn causing agents or hot surfaces and/or Worksheet H3 "Kitchen Safety: Preventing Fires" "Fire Prevention: In the Home" Both are available from the Academic Support Center at UMC Strips of paper with fire hazards written on them Guest speaker

ACTIVITY	MATERIALS/RESOURCES
TASK I: Student will demonstrate the correct method for setting up and climbing a ladder.	
1. Introduce the lesson by showing the students a ladder or a picture of a ladder. Ask the students what a ladder is used for. Be sure everyone can identify a ladder and its use before going on. (Show straight and folding ladders.)	Ladder or picture of ladders
2. Explain to the students that a ladder is used for climbing. Ask why we can't just use chairs (some are too high, they are not safe or sturdy enough sometimes, etc.). Discuss possible hazards of using a chair for climbing. Discuss possible hazards of using a ladder. Point out to the students that the ladder must be in good repair.	
3. Invite a painter in to demonstrate how to prop a ladder against a building in order to paint. Point out that a straight ladder should be placed at a 70 degree angle with the ground. Ask why that is so important. (Students should respond with something to the effect that if the ladder is too far away, it can easily slip; if it is too close, the least change in the distribution on your weight at the top can cause it to topple backwards.) Do not demonstrate climbing and having this happen, but do allow each student to set the ladder up at a 70 degree angle to make sure they understand approximately what 70 degrees looks and feels like.	Guest speaker Straight ladder
4. Discuss with the students that when using a straight ladder you must make sure the ladder is the right length. If it is too short it could easily slip. It should generally be at least 3 feet above the roof to give you an extension to lean against so you don't fall. Show students pictures of ladders beside houses and have them select the ladder best suited for the job. Make sure they understand the ladder should be taller than the job needed. 5. Ask the students what they would do if they set up the right length ladder at the right distance from the building, but they could not reach the whole side of the building from the ladder in order to paint the building. (Students will hopefully respond that they would have to get down from the ladder frequently in order to move it and not try to move the ladder by standing on it or not try to paint leaning way over.) Make sure the students understand the danger of stretching far to do a job while standing on a ladder.	Straight ladder
6. Bring in a step ladder and ask each student to set it up in the proper fashion (after a demonstration). Be sure to get a sturdy ladder and check the following: Is it in good repair? Does it have rubber tips to keep it from sliding on a slick floor? Do the hooks on the ladder work safely? Are there any cracks in any part of the ladder? Then, open the ladder, spread both sides evenly apart, hook each side snugly into place, and test the strength of the ladder by putting your weight on it (lifting your feet just off the floor). Then have the students climb the ladder with assistance if necessary. Finally have them climb down from the ladder (again, with assistance if necessary, but eventually alone). You might want to put each of these steps on a sheet and check off only the parts the student can do alone.	Folding step ladder Checksheet of ladder safety

ACTIVITY

MATERIALS/RESOURCES

TASK J: Student will read and understand basic safety instructions.

1. Explain to the students that being able to read and understand safety instructions is important whether they are working in a shop, McDonald's, their own kitchen, or wiring a toy for a child for Christmas. Ask the students to think of places where they have had to read safety instructions and if they understood them. Usually instructions are given in a step-by-step format. If they are not, the student would want to break it down that way.
2. Ask the students what they would do if they were to fix an electrical outlet and the first safety instruction on the directions was "never work on an electrical path or circuit until you have located and disconnected the master switch." Students may have trouble with some of the terms and may need pictures or actual experience going through the safety instructions, so show them the action on Worksheet J2 as a demonstration of following up that job. Give the students worksheets with safety instructions written on one side and pictures of those tasks on the other side. Have them match the picture with the proper safety instruction as on Worksheet J2.
3. Locate the safety instructions for various appliances in the classroom (tape recorder, language master, etc.) and ask the students to demonstrate the first safety instruction.
4. Ask the students to report on their at-home activities telling something they learned that they hadn't known previously. Have the other students note all of the safety instructions of which they are now aware.
5. Name a job to be done which would require safe action. Ask the students to write the safety instructions in a step-by-step process in order to show that they know how to safely use that object.

Worksheet J2

Safety instructions for appliances, etc.

Worksheet B4

Name _____

We practice the following safety procedures in my home:

- _____ 1. Poisons are put out of the way of small children.
- _____ 2. Cords are in good condition with no wires showing.
- _____ 3. A smoke alarm is present and works.
- _____ 4. My family has a practiced procedure for getting to safety in case of a fire or tornado.
- _____ 5. Knives are kept in a safe place.
- _____ 6. No toys, books, or other items are placed on the steps.
- _____ 7. All of the hand tools in our house are used only by those who have shown they know how to use them safely.
- _____ 8. Paper and old oily rags are kept out of areas where a potential fire might result.
- _____ 9. Emergency phone numbers are kept by the phone at all times.
- _____ 10. Whenever something breaks in my house, we fix it immediately so no one gets hurt.
- _____ 11. We have a fire extinguisher that is in working condition and I know how to use it.
- _____ 12. The household heating and air conditioning system is checked regularly for safety.
- _____ 13. There are not curtains near our fireplace or stove.
- _____ 14. We do not plug more than one thing in each electrical outlet.
- _____ 15. No one smokes in bed or sets the ashtray on the couch or other flammable objects.
- _____ 16. We have occasional home safety discussions.
- _____ 17. We do not have wrinkles in our carpet which would possibly make someone fall.
- _____ 18. We use a stepladder to reach high places.
- _____ 19. We have good lighting in our house - especially on the stairs.
- _____ 20. Whenever we spill something, we wipe it up before anyone has a chance to fall.
- _____ 21. We keep rubber strips or adhesive strips in the bathtub.
- _____ 22. We do not keep electrical appliances (like a TV or radio) on the edge of the bathtub.
- _____ 23. We do not touch electrical things with our hands wet.
- _____ 24. We do not keep medicines in the house after we have finished taking the necessary amount.
- _____ 25. We do not falsely report an emergency.

Worksheet D2

LIFTING AN OBJECT

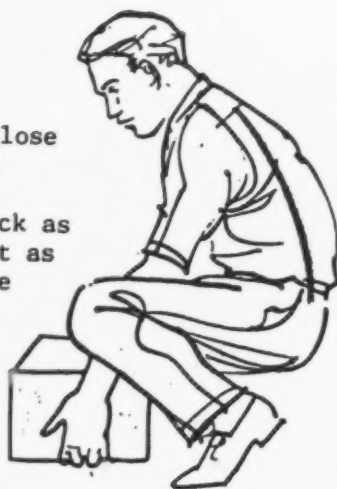
Incorrect Lifting Technique



Lift with your leg muscles, not with your back, or your "muscle machinery" may be injured.

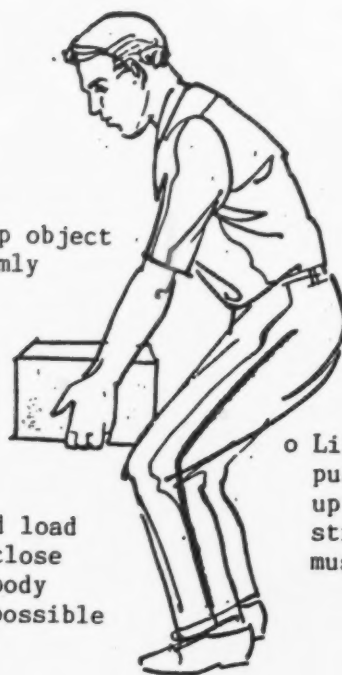
Correct Lifting Technique

- o Squat close to load
- o Keep back as straight as possible



- o Grip object firmly

- o Hold load as close to body as possible



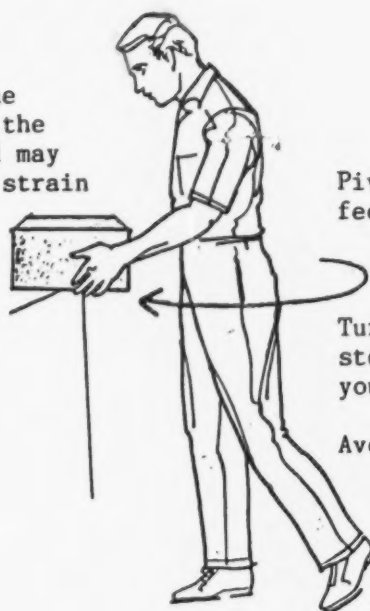
- o Lift by pushing up with strong leg muscles

Worksheet D2a

DIRECTION OF MOVEMENT



Twisting the back pulls the muscles and may cause back strain



Pivot with your feet

Turn with short steps and turn your whole body

Avoid twisting

Let Your Legs do the Work . . .
Not Your Back

Kneel or squat . . .
when you perform a job
near the floor. Bend
the knees instead of
bending from the waist.
This saves tiring or
straining back muscles.



Worksheet F3

SAMPLE KNIVES

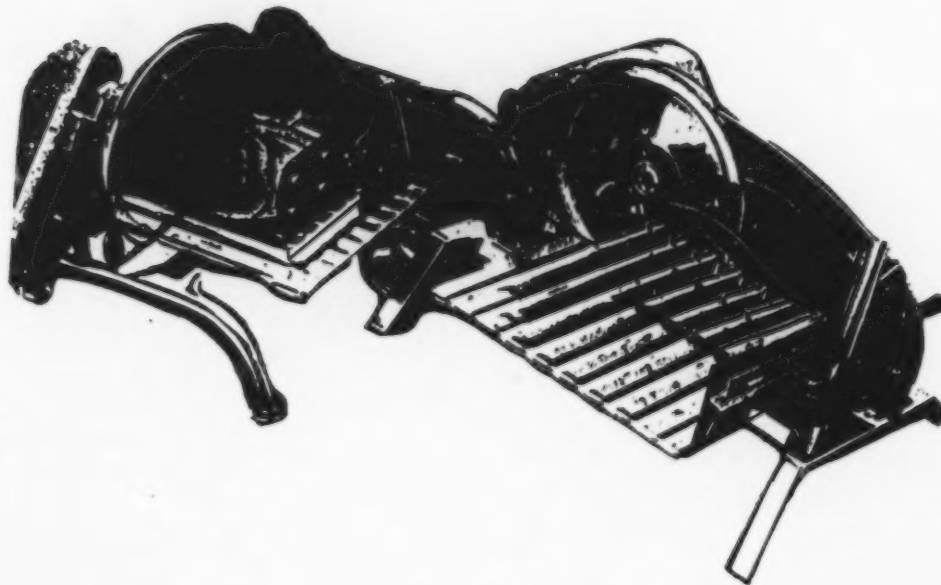
Pocket Knives



Electric Meat Slicer
or Slicing Knife



Electric Food Slicer



Worksheet G4

Operate power tools and equipment only after getting approval of the instructor.



Never wear jewelry when operating power tools or machines.

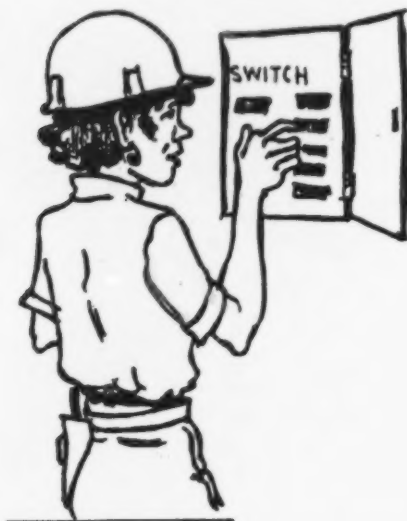


NEVER switch an electrical device on or off when you are wet or while standing in water. Water conducts electrical current.



Worksheet J2

Directions: Match the following actions with the safety instructions which best describe the action to be taken.



ALWAYS unplug electrical cords by pulling the plug instead of the cord. Pulling on the cord can damage the wiring in the plug.



NEVER work on an electrical path or circuit until you have located and disconnected the master switch. The master switch controls power.



Read all safety rules, posters and notices before operating any machine.

Worksheet H3

Ouch, that's
hot!



If the water you stepped into was too hot, what might happen?

What things could you do to prevent a burn from hot water?



Don't test a stove burner to see if it is hot by putting your hand on it. Check the controls on the stove to see if it's on and hold your hand 6-8" above the burner to feel the heat - not the burner.

What would happen if you put your hand on the burner even if it wasn't red hot?

What are some other safety measures you can take to keep yourself and others from being burned by a hot surface like a stove top?

INSTRUCTIONAL MODULE

ACCESS SKILL: TOOL IDENTIFICATION

TASKS ANALYSIS STEPS: A-F

VOCATIONAL AREA:
Horticulture
Small Engine Repair
Agriculture Power I
Agriculture Machinery

ACTIVITY	MATERIALS/RESOURCES
TASK A: The student will identify specific tools when presented with only one tool.	
1. Introduce to the students what the lessons are going to be (regarding tools) and have them discuss what tools they have used, what they look like, and how the tools are used. Ask the students to discuss in groups what they made with the tools with which they are familiar. <u>Follow-up:</u> Ask the students to inquire of their parents which tools they have on hand around the house and which tools they are allowed to use. The parents might even want to begin to think of a project for their child once the child is better prepared to use the tools.	
2. Hand out either pictures of tools or the actual tools to the students but require them to keep quiet while this is taking place. Once every student has a tool or the picture of a tool, ask him or her to introduce that tool to the class - telling how it is used, its name, etc.	Tools or pictures of tools
3. The teacher might hold up each tool or picture of a tool (one at a time) and call on specific students to name the tools. This could even be a game if there are enough students to work on teams. Have the students get into two teams and allow one person on each team to take turns labeling by name the tool the teacher displays. The team that wins the most points by naming the most tools could get first use of the tools. <u>Follow-up:</u> Assign each student a specific tool and ask that the parents then give the student magazines at home so the student can locate five pictures with that particular tool displayed.	Tools or pictures of tools Magazines, tape or paste, and scissors
4. Use the pictures the students have brought in and have the students identify the tools in the pictures. Pictures of objects are not always exactly like the object, and the tools must be recognizable in a general way in order to consider this skill "learned".	Pictures of tools from magazines
5. If any student is having difficulty identifying a particular tool, you could either have the students break into pairs or work one to one with that student on identification in the following manner: Hold up an object, go on to the next item. Any time the student does not name the item correctly, the first time he/she sees it, you may want to ask the student that item repeatedly until he/she answers correctly five out of five times. Be sure to tell the student the correct answer so he does not have to keep guessing.	Tools or pictures of tools
6. Let the students take turns with the tools - have each student pick out a tool that he/she wants to use. Then each student can stand in the front of the room and tell the name of that tool OR the student may choose to give it an incorrect name and see if everyone agrees with him/her.	Tools or large pictures of specific tools

ACTIVITY

MATERIALS/RESOURCES

TASK B: The student will identify the specific tools when presented with two or more tools

1. Discuss with the students the purpose of being able to identify one tool from another or a whole group of tools. Not very often do we find someone who has just a hammer. Most workshops and homes also have other tools such as screwdrivers, saws, etc. We must be able to choose the correct one when we decide to do some work or to fulfill a parent request for a particular tool.
2. Place two tools on a table and label them A and B. Ask the students to place a check next to A if that item is a hammer or next to B if that is the hammer. Put all of the tools in pairs and have them mark the correct answers. (This requires no writing skills other than making an x next to the correct letter or label.
3. Show the students groups of 3 items and ask them to tell you which tool is in the middle.
4. Show the students groups of 4 items and have them point to the item you name correctly. The students should do this correctly before moving on.
5. Break the tools into 4 sections and have the students work in small groups. Have each group quiz each other over the names of each item. When all groups feel they are ready, indicate for them to "GO" and time them. See which group can identify which cluster of tools the fastest with no errors and then switch tools. This can be played as a game for groups or you could do this individually - just timing the student to see how long it took him to identify all of the tools correctly.

Label for tools,
paper, pencils, tools

Tools

Tools

Tools

TASK C: The student will label each tool with its correct name

1. Give the students a worksheet with all of the tools names. Label the tools A-T and display them on a table. Ask the students to put the correct letter that appears on each tool next to its proper name on the worksheet. Be sure to go over the names with each student individually (if possible) to be sure the students recognize and understand how to read each. (See Worksheet C1.)
2. On index cards write the name of each tool and be sure the students can read the names. Ask each student to correctly find each tool by matching the correct tool with its name.

Worksheet C1, pencils,
tools and labels for
each tool

Index cards, pens, and
tools

Follow-up: Have each student make his/her own index cards with tool names on them to take home and ask the parents to allow the students to try finding those tools in their home and labeling them correctly. Ask the parents to check after the student has done so and to report back to you the next day.

ACTIVITY

MATERIALS/RESOURCES

TASK D: Given names of tools, the student will accurately describe the tool

1. Now that the student can correctly match the name of tools with that specific tool, the teacher might want to simply hold up the name and ask the child to describe that tool. (You may even want to describe each tool before you get to this step if the students have difficulty with language skills.) See how many tools can be clearly described without looking at the tool.
2. Name a tool but do not hold up the label and ask the student to describe that item.
3. Whisper the name of a tool in each student's ear and have that student try to draw the tool on the chalkboard. (Do not count off for weak artistic skills.) See how many items look alike at the end of the drawing time.

Name cards (names of tools)

Chalkboard, chalk

TASK E: The student will describe the use of specific tools

1. Show the student a picture of an object (tool) and have him match its use as written on a worksheet.

Worksheet E1

Follow-up: Ask each student to interview a relative or neighbor to find out if he/she has the tools we have studied and how he/she uses them in his/her shop. Require the students to report the next day on how those tools were used by the interviewee.

2. Identify the use of a tool and ask the students to tell which tool you are speaking of. This can be done in a team setting and see which team can name the most tools correctly.

Follow-up: Ask the student to select a tool and design a bulletin board which will show the many uses of that tool. Display the best of these.

Poster board, colored pens, paint, magazine, pictures, etc.

3. Once the student can identify each tool when given its use, have him/her write a brief report describing how that tool is used in each house that you picture is probably different. It is the same with tools. If I say the word "tools" you all think of different ones. Even things like screwdrivers we know are different even though they are screwdrivers. We are going to talk about how each of these tools are different - in looks, material they are made of, weight, length, uses, etc. Who can tell me the difference in a standard screwdriver and a Phillips screwdriver?" (Allow the student, but each house that you picture is probably different. It is the same with tools. If I say the word "tools" you all think of different ones. Even things like screwdrivers we know are different even though they are screwdrivers. We are going to talk about how each of these tools are different - in looks, material they are made of, weight, length, uses, etc. Who can tell me the difference in a standard screwdriver and a Phillips screwdriver?" (Allow the students to discuss the differences in a few tools and then follow up with worksheet F1.)

ACTIVITY	MATERIALS/RESOURCES
TASK F: CONTINUED	
2. Assign each student one tool and have each write or tell briefly what that tool is like - what it is made of, used for, etc. Then allow another student to report, telling how his/her tool is different from the other students' assigned tool. 3. Have the student measure each of the items and tell how many are the same length. (If only pictures are available have them estimate which are the same size.) Then put tools of the same length in separate brown paper bags and pass the bag around to be lifted. See if the students can identify the tool without looking at it - just by its weight. If students have difficulty let them feel the object inside the bag to get a hint.	Tools, brown paper bags, rubber bands (to close the bags)

Worksheet C1

Directions: Find all the tools on the table in the back of the room. Read over the names of each of the tools on this worksheet. If you do not recognize the name of one of the tools, be sure to ask your teacher before you begin to complete this worksheet.

Walk by the tools on the table and decide what the first tool is and put the letter that appears on that tool next to the name of the tool on this sheet.

For example: If the first item on the table was a hammer, and had an A beside it, I would put an A on the blank line next to the word hammer.

- | | |
|----------------------------|--------------------------|
| ___ flat blade screwdriver | ___ open end wrench |
| ___ tape measure | ___ box end wrench |
| ___ shovel | ___ ball peen hammer |
| ___ rake | ___ long nose pliers |
| ___ torque wrench | ___ scissors |
| ___ socket wrench | ___ calculator |
| ___ utility knife | ___ safety glasses |
| ___ hammer | ___ trowels |
| ___ flat feeler gauge | ___ hoe |
| ___ pliers | ___ Phillips screwdriver |

Total correct _____

To the teacher:

Display only the items listed above on a table in the back of your classroom and label each tool with the letters A to T. Allow the students approximately 15 minutes to match all of the items with their name and then grade their answers or have the correct name on the back of the label for them to self-check.

Worksheet E1

Directions: Watch your teacher. He or she is going to show you pictures of objects one at a time. You are to match that object with the use of the object on the lines below.

- Used to measure gap in spark plug _____
- Used to tighten nuts, bolts, etc. _____
- Used to install and remove cross slotted screws _____
- Used to tighten or loosen screws in hard to reach places _____
- Used to compute figures or add, subtract, multiply and divide in order to find the correct answer _____
- Used for spreading, smoothing, or scooping plaster, soil, etc. _____
- Used to tighten nuts to specification _____
- Used to lift and move material such as dirt, snow, gravel, etc. _____
- Used to find the length of any object up to 10 feet in length usually _____
- Used for softly tapping metal into place _____
- Used for driving and pulling nails _____
- Used to grip small pieces of wire, wood or metal _____
- Used to install and remove cross-slotted screws _____
- Used for holding and turning nuts, bolts, pipes, etc. _____
- Used for cutting paper or cloth material _____
- Used for eye protection _____
- Used for cutting weeds and loosening up the earth in the fields _____
- Used to gather together things - like leaves, scraps, etc. _____
- Used to cut and trim small pieces of wood and plastics _____
- Used to cut wire, and looks like a needle nose pliers without the nose _____

Worksheet F1

Directions: On this page, you will find two tools named in each group. You are to match the letter in front of the tool with the use of the tool in the right hand column. Some tools will be used for more than one of the possibilities.

Example: a. hammer
b. screwdriver

b You can install with this tool
a You can install a nail with this tool
a You can remove nails with this tool

1. a. hammer
b. pencil

 You can pound things with this tool
 You can pound nails into a wall with this tool
 You can draw with this tool

2. a. pliers
b. box end wrench

 You can hold small items with this tool
 You can turn nuts and bolts with this tool
 You can twist small pieces of wire with this tool

3. a. flat blade screwdriver
b. Phillips screwdriver

 You can install and remove screws
 You can install and remove slotted screws
 You can install and remove cross-slotted screws

4. a. socket wrench
b. long nose pliers

 You can hold small objects with this tool
 You can cut wire with this object

5. a. scissors
b. utility knife

 You can cut wood and plastics with this tool
 You can cut paper with this tool
 You can cut with this item

6. a. safety glasses
b. calculator

 You wear this item for working safely
 You can wear this item

7. a. trowels
b. hoe

 You can smooth plaster with this tool
 You can dig in your garden with this tool

VIMS Competencies for Agricultural Structures
and
Agricultural Construction

As was noted in the introduction, two vocational programs in Agricultural Structures and Agricultural Construction, do not have instructional activities in this book. The ACCESS SKILLS in these two areas are very closely related to welding (Agricultural Structures) and Carpentry (Agricultural Construction) which have instructional activities in the ACCESS SKILLS: Vocational Readiness Skills for Trade and Technical. Students interested in either of these agricultural programs should be assessed and instructed following the skills for welding and carpentry.

VIMS COMPETENCIES FOR AGRICULTURAL STRUCTURES I

The student has mastered the related competencies of Agricultural Science I and II.

A. Constructing Farm Buildings

1. Identify the essential factors of a farmstead plan, and establish wind and snow controls
2. List and discuss the steps in planning and purchasing a farm building
3. List and discuss the factors associated with site selection
4. Identify the proper fasteners for specific usages and join wood together with all three methods
5. Calculate insulation needs, heat loss, and supplementary heat needs
6. Describe how to lay out the foundation for a building and construct the footings
7. Describe how to construct a floor and subfloor on a foundation
8. List the purpose of walls, the types of walls, wall supports and siding used in farm buildings
9. Lay out and construct a truss for a farm building
10. Describe how to attach different types roofing
11. Read plans, identify materials and types of utility buildings
12. Select buildings and equipment for the different swine systems
13. Identify, select and check the quality of lumber used in farm structures
14. Use basic design criteria to plan feeding, waste management and material handling facilities
15. Identify the types and designs of pole buildings and their methods of construction
- *16. Discuss the terms, dangers and safety practices associated with constructing farm buildings
Other (specify)

B. Planning Farm Water Systems

1. Calculate how much water is needed to meet home and farm needs
2. Determine water pollution, prevention of pollution, when water is safe to use and methods of purification
3. Determine the need for water conditioning
4. Describe the methods of water conditioning and their advantages and disadvantages
5. Determine pump capacity, type and size required to meet peak water use demands
6. Design an underground piping system, given the sizes and dimensions needed to meet the demand

7. Explain what wiring installation is necessary to protect the motor and the motor circuit
Other (specify)

C. Managing Livestock Wastes

1. Define the characteristics of waste disposal systems
2. Identify different groups of wastes and the hazards of these wastes
3. Select a collection system by considering the type of facility, labor requirements, investment and total waste handling needs
4. Determine runoff flow, methods of collection and select proper waste system
5. Identify flushing devices and describe the two designs of flushing devices
6. List the types of storage units and needs of a storage system
7. Separate solids and liquids using settling, screening, and evaporation techniques
8. Identify the advantages and disadvantages of different biological treatment systems
9. Identify the waste transport systems available for moving manure
10. Plan for an effective and profitable utilization of livestock wastes
Other (specify)

D. Building Fences

1. Lay out clean fence lines
2. Set and brace wood and steel posts
3. Build barbed wire and woven wire fences
4. Design and install gates for electric fences
5. Install cable fence springs; stretch and secure cable
6. Design and install welded-wire panel fences
7. Design and install board fences
8. Build metal, wood and temporary gates
- *9. Discuss the terms, dangers and safety practices associated with building fences
Other (specify)

*All competencies involving safety require a number 3 rating.

VIMS COMPETENCIES FOR AGRICULTURAL STRUCTURES II

The student has mastered the related competencies of Agricultural Science I and II.

A. Working with Concrete

1. List the raw material components of concrete
2. Discuss component quality, mix a batch of concrete and conduct slump test
3. Prepare the slab site location
4. Finish the concrete slab surface
5. Explain the curing process of concrete
6. Calculate the quantity of materials needed to complete a concrete job
7. List procedure for constructing and removing forms
8. Explain the reasons and methods for placing and reinforcing concrete
9. List the three main concrete surface defects, their causes and preventive procedures
10. List the ways to roughen new and hardened floors
11. Name the types of concrete masonry and why they are used in the building industry
12. Lay out the corners of a building without surveying equipment
13. Plan, form and cast a footing for a concrete block building
14. Prepare a mortar mix for concrete masonry
15. Lay out, mortar and construct the first course of blocks
16. Construct a block corner
17. Use the mason's line and lay blocks between corners
18. Explain why mortar joints are tooled and the procedure for tooling a joint
19. Set anchor bolts, plan drainage, and protect walls
- *20. Discuss the terms, dangers and safety practices associated with concrete work
Other (specify)

B. Drawing and Plan Reading

1. Identify drawing instruments
2. Perform the basic procedures in mechanical drawing
3. Draw letters in the vertical capital style of lettering
4. Identify and draw isometric, oblique, orthographic and cross-sectional drawings
5. Read and interpret a working plan
6. Develop a bill of materials for a construction project
Other (specify)

C. Planning Grain-Feed Handling

1. Explain the flow of materials concept and the need for planning
2. Set up and expand a closed-loop grain handling system
3. Compare gravity and conveyor systems; as well as bin types, sizes and uses
4. Design a grain-handling system by matching controls and components
5. Identify the components of a materials flow system
6. Evaluate factors affecting storage of grain
Other (specify)

D. Electrical Work on the Farm

- *1. Discuss the terms, dangers and safety practices associated with electrical work
2. Define the use of GFCI's and explain their uses in farm structures
3. Identify the symbols used in farm wiring plans
4. Match the types of wire with its use
5. Locate lights, outlets and switches, and identify protection needs in farm structures
6. Plan the electrical power needs of farm structures
7. Calculate the electrical power needs of farm structures
8. Select feeder wires based on amperage load and wire run
9. Run electric lines to an agricultural structure
10. Connect the drop wires and branch circuit wires to the S.E.P.
11. Run wires from the service entrance panel to the outlets of each circuit
12. Wire junction boxes, simple light and receptacle circuits, and splice wires
13. Calculate cost and electric power utilizing Ohm's Law
14. Install lighting arrestors
Other (specify)

E. Plumbing on the Farm

1. List procedures for establishing a plumbing system
2. Identify the equipment and supplies needed to install or repair on-farm water systems

3. Identify the types of pipe and fittings used in farm plumbing
4. Measure, cut and join pipe by cementing and threading
5. Identify and install different methods of waterpipe protection to prevent freezing
- *6. Discuss the terms, dangers and safety practices associated with plumbing work
Other (specify)

F. Alternative Energy Systems

1. Describe the energy systems being currently used
2. Identify basic solar energy principles that apply to planning agricultural buildings
3. Identify the principles of a passive solar system
4. Identify the principles of an active solar system
5. Identify the parts needed, efficiency and applicability of alternate energy systems
6. Explain the procedure for converting manure to methane gas
Other (specify)

* All competencies involving safety require a number 3 rating.

VIMS COMPETENCIES FOR AGRICULTURAL CONSTRUCTION

The student has mastered the related competencies of Agricultural Science I and II.

A. Arc Welding

1. List the safety procedures for arc welding *
 2. Identify the various types of metals and their properties
 3. Prepare metals for welding: cutting, grinding, and/or cleaning
 4. Weld in all positions with stick welder
 - a. Weld in flat position using 6010 and 7018 **
 - b. Weld in horizontal position using 6010, 6011, and 7018 **
 - c. Weld in vertical up position using 6010, 6011, and 7018 **
 - d. Weld in vertical down position using 6010 and 6011 **
 - e. Weld in overhead position using 6010, 6011, and 7018 **
 5. Weld in all positions with MIG welder (Gas Metal Arc Welding)
 - a. Weld in flat position using E-70S-3 and E-71S-3 **
 - b. Weld in vertical position using E-70S-3 and E-71S-3 **
 - c. Weld in horizontal position using E-70S-3 and E-71S-3 **
 - d. Weld in overhead position using E-70S-3 and E-71S-3 **
 6. Hardsurface areas where extensive wear may occur
 7. Weld cast iron
 8. Weld pipe
- Other (specify) _____
- _____
- _____

B. Oxy-Gas and Other Cutting/Welding Processes

1. List the safety procedures required for using oxy-acetylene equipment *
 2. Perform in order the complete procedure for lighting, adjusting the flame and shutdown of the torch *
 3. Weld in all positions with oxy-gas welder
 - a. Weld in flat position
 - b. Weld in horizontal position
 - c. Weld in vertical position
 - d. Weld in overhead position
 4. Perform a hardsurfacing operation
 5. Weld cast iron using rod and flux
 6. Perform a braze weld operation
 7. Perform cutting with oxy-gas
 8. Perform cutting with arc-air
 9. Cut using the motorized torch
 10. Select appropriate tip for the job to be performed
- Other (specify) _____
- _____
- _____

* All competencies involving safety require a Number 3 Rating.
** Pass destruction test.

C. Woodworking

1. Identify common woods used in agricultural construction
 2. Select the proper fastener for a specific job
 3. List the actual and nominal dimensions of common construction lumber
 4. Use hand woodworking tools
 - a. _____
 - b. _____
 - c. _____
 - d. _____
 - e. _____
 - f. _____
 - g. _____
 - h. _____
 - i. _____
 5. Use power woodworking tools
 - a. _____
 - b. _____
 - c. _____
 - d. _____
 - e. _____
 - f. _____
 - g. _____
 - h. _____
 - i. _____
 6. Select preservatives
Other (specify) _____
- _____
- _____

D. Metals

1. Select metals by design and strength
 2. Explain how construction metal is dimensioned
 3. Remove stress risers
 4. Identify common metal fasteners
 5. Identify the hardness grade of a bolt
 6. Control heat distortion of metals
 7. Assemble work using proper locks and fasteners
 8. Use heat to shape metals
 9. Use tap and die set to do threading
 10. List steps used in tempering, annealing, hardening, wrinkle bending, normalizing, and welding to control crystallization
- Other (specify) _____
- _____
- _____

E. Finishing

1. Prepare surfaces for finishing
 2. Select the primer to use before painting the surface
 3. Select the paint to use in the finish operation
 4. List the steps for cleanup after finishing operation is complete
- Other (specify) _____
- _____
- _____

F. Project Construction

1. List the safety procedures for project construction *
 2. Select and design a project plan
 3. List tools needed to complete project and list safety precautions
 4. Develop a bill of materials and projected cost list
 5. Determine a time frame for completion of a project
 6. Interpret the project construction plan
 7. Lay out and prepare materials for cutting
 8. Determine construction design for proper hitching and balancing
 9. Determine construction design for legal specification: width, length, weight, etc.
 10. Identify and correct project defects by approved methods
 11. Perform assembly procedures
 12. Describe why a project should have a finish
 13. Determine actual cost of materials and labor for project
 14. Hand and power tools used in completing this project
 - a. _____
 - b. _____
 - c. _____
 - d. _____
 - e. _____
 - f. _____
 - g. _____
 - h. _____
 - i. _____
 - j. _____
 - k. _____
 - l. _____
 - m. _____
 - n. _____
 - o. _____
- Other (specify)
- _____
- _____
- _____